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Approval Sheet

Understanding HIV Transmission Risk in Married HIV Serodiscordant Couples in Gujarat, India: The Positive Jeevan Saathi Study

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Doctor of Philosophy

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Understanding HIV Transmission Risk in Married HIV Serodiscordant Couples in Gujarat, India: The Positive Jeevan Saathi Study

By

Shilpa Narendra Patel
Master of Public Health, Boston University, 1999

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An abstract of
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Abstract

Understanding HIV Transmission Risk in Married HIV Serodiscordant Couples in Gujarat, India: The Positive Jeevan Saathi Study

By Shilpa Narendra Patel

Background: Few studies have examined the factors that contribute to HIV transmission risk among HIV-negative wives in married serodiscordant relationships in India. No study addresses this issue in Gujarat, a state with one of the largest numbers of new cases of HIV in India.
Methods: This study employed a mixed-methods study design. First, in-depth interviews with 23 HIV serodiscordant couples were conducted in either Gujarati or Hindi with HIV-negative wives and their HIV-positive husbands. Interviews focused on marital sex as well as the factors that protect against and put HIV-negative wives at risk for HIV. Data were analyzed using Grounded Theory in Maxqda. Second, one couple was selected as a case study to illustrate how specific factors amplify HIV transmission risk. Lastly, surveys were administered to 185 HIV-positive husbands and their HIV-negative wives to describe their individual, interpersonal, and behavioral characteristics, as well as the factors associated with inconsistent condom use and male-dominated sexual decision-making, using SPSS 18.0.
Results: Based on the qualitative data, fear of HIV, positive sex communication, the wife's assertiveness to protect herself, mutual respect regarding sexual desire, and the husband's desire to protect his HIV-negative wife, promoted safer sex or no sex. Factors that placed wives at risk for HIV included husband's alcohol use, intimate partner violence (IPV), and displeasure with condoms. In addition, unfulfilled sexual desire and refusal of sex contributed to extramarital relations. Survey data showed a high proportion of husbands and wives reported joint sexual decision-making and consistent condom use in the past three months. Wives who reported any communication about sex with their husbands were less likely to report inconsistent condom use or male-dominated decision-making regarding condom use. About 20% of wives reported IPV; wives who reported male-dominated sexual decision-making were more likely to report IPV.
Conclusions: While a high proportion of HIV-positive husbands and their HIV-negative wives reported consistent condom use, several factors created challenges in maintaining such behavior. Addressing topics such as sexual fulfillment, safer sex methods, and sex communication; as well as IPV and alcohol use may be important in preventing risk to HIV-negative wives in HIV serodiscordant relationships.

Understanding HIV Transmission Risk in Married HIV Serodiscordant Couples in Gujarat, India: The Positive Jeevan Saathi Study

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***

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Overview of Problem

After Africa, India has the third largest number of HIV cases in the world, with an estimated 2.5 million infected individuals (UNAIDS, 2007). Approximately 75% of Indian women are married by age 19, and 40% of new infections occur among married women ages 15-49 (IIPS & Macro). In addition, over 80% of new infections are believed to be a result of heterosexual transmission (NACO, 2006). Given the dominance of heterosexual transmission, understanding the interpersonal characteristics that place a married woman at risk is essential to curb the spread of HIV in India.

Globally, mounting evidence suggests that the greatest risk for HIV transmission among women lies within marital relationships (Decker et al., 2009; Dunkle et al., 2008; Godbole & Mehendale, 2005; Schensul et al., 2006; Silverman, Decker, Saggurti, Balaiah, & Raj, 2008), a fact that has not been fully incorporated into HIV prevention programs in India. In fact, research in India suggests that HIV-negative women in serodiscordant relationships have the highest risk for acquiring HIV, compared to HIV-negative men in serodiscordant relationships (Decker, et al., 2009; Godbole & Mehendale, 2005; Kumarasamy et al., 2010; Rogers et al., 2005). However, few studies have examined the factors that contribute to HIV transmission risk (or *HIV seroconversion*) among HIV-negative married women in India, and no study to our knowledge addresses this issue in the Indian state of Gujarat, where the

incidence of HIV is believed to be increasing among married couples (Gujarat State AIDS Control Society, 2007).

Although research has shown that consistent and correct condom use can help reduce HIV transmission to a HIV-negative partner (Malamba et al., 2005), consistent condom use among married couples in India may be low (Roth, Krishnan, & Bunch, 2001). Factors underlying *inconsistent condom use*, defined as less than 100% condom use among sexually active, married HIV serodiscordant couples, is not well-established in India or in Gujarat specifically. Individual-level factors alone, such as knowledge of correct condom use, condom negotiation self-efficacy, and alcohol use may not fully explain HIV transmission risk in serodiscordant couples. Interpersonal and socio-cultural factors such as communication about safer sex, intimate partner violence (IPV), and strong social norms that enforce traditional gender roles and responsibilities of husbands and wives may also contribute to HIV-negative wives' increased susceptibility to HIV/AIDS (Chin & Bennett, 2007; Godbole & Mehendale, 2005; Gupta, 2002). However, few studies in India have examined whether these factors, separately or collectively, increase HIV transmission risk among HIV-negative women in serodiscordant couples.

Most HIV/AIDS research in India has been focused in the southern states, where the HIV/AIDS epidemic is well characterized and surveillance and prevention efforts have grown over the past decade; however, the extent of the HIV/AIDS epidemic in the northwestern states of India, which boast three times the population of South India, has not been well documented (NACO, 2006). While states like Gujarat historically have had fragmented surveillance efforts, evaluation has improved in recent years, because

of the increase in HIV incidence in that state (Press Trust of India, 2011). With reference to the HIV epidemic, Gujarat is considered a moderately-impacted state with an HIV prevalence of less than 5% (Gujarat State AIDS Control Society, 2007).

HIV Prevention among Heterosexual Serodiscordant Couples

Heterosexual exposure continues to be a major route of HIV transmission worldwide. Behavioral interventions targeting HIV risk among heterosexual couples are sorely needed (Godbole & Mehendale, 2005; NIMH, 2008a, 2008b; Solomon, Buck, Chaguturu, Ganesh, & Kumarasamy, 2003), particularly where one partner is HIV-positive and the other is HIV-negative, also known as serodiscordant. Findings from the two largest HIV serodiscordant couples cohorts in the world show that not all couples use condoms consistently to prevent transmission to the HIV-negative partner, even after they become aware of their HIV status (Allen et al., 2003). In a study in India, 70% of male partners continued to have sex with their spouses without condoms even in the presence of active STIs (Bentley et al., 1998; Godbole & Mehendale, 2005). However, it is unclear whether and how HIV diagnosis among male partners in Gujarat reconstructs the power differential within the marital relationship and reshapes sexual activity and communication among married couples. Specifically, the extent to which married serodiscordant couples adopt prevention measures, such as consistent condom use, is not well understood.

In Africa, an estimated 20-25% of serodiscordant couples who do not know their HIV discordant status transmit the virus to their negative partner (Allen, et al., 2003). In addition, based upon findings from the two largest HIV serodiscordant couples cohorts in

the world, located in Kigali, Rwanda and Lusaka, Zambia, not all couples adopt risk reduction behaviors to prevent transmission to the negative partner. For example, among serodiscordant couples who attended voluntary counseling and testing centers, the reduction of HIV seroconversion reached a plateau of 5-7% per year (Coldiron et al., 2008). In addition, studies in the United States demonstrate that interventions targeting communication skills among serodiscordant couples can lead to increased HIV testing among negative partners and increased couples' communication about HIV risk reduction and sex, in general (El-Bassel et al., 2010; El-Bassel et al., 2001). A small study (n=48 couples) by McGrath and colleagues in southern India showed preliminary evidence that a group-based behavioral intervention targeting condom negotiation and problem solving skills might help increase individual and interpersonal level determinants of behavior for HIV serodiscordant couples. Using a pre-post design, measures (including condom attitudes and condom usage) were assessed at baseline, and at the one and three month follow-ups. According to the follow-up survey results, condom use increased from about 33% to nearly 100% (McGrath et al., 2007).

Individual-level Determinants of HIV Risk

Poor condom negotiation self-efficacy and negative attitudes about condoms have been associated with unprotected sexual behavior (Rodrigues et al., 1995; Roth, et al., 2001; Sharma, Dave, Sharma, & Chauhan, 1997; Sivaram et al., 2005; Sri Krishnan et al., 2007); however, little research has been conducted on condom use attitudes and condom use self-efficacy among serodiscordant couples in India. Specifically, it is unclear whether husbands' HIV status produces more favorable attitudes towards condoms

simply because it would protect wives from acquiring HIV. In addition, little is known about men's and women's knowledge of correct condom use in Gujarat.(Sarkar et al., 2008). Based on the National Health and Family Survey, 33% of women in Gujarat did not know how to avoid HIV infection. Lack of information and knowledge of HIV/AIDS can be a barrier to safer sex practices (Steward WT). However, married serodiscordant couples may have higher levels of knowledge, particularly if couples are receiving counseling services from the drop-in centers or voluntary counseling and testing centers in Gujarat. The knowledge level of these couples may be higher than the average married couple in Gujarat. In addition, more time since a husband has been living with HIV/AIDS may be positively associated with higher levels of knowledge. Time since diagnosis may also influence husbands' perceptions of HIV transmission risk; however, it is unclear whether women's perceptions of HIV acquisition risk may be influenced in a similar way.

Besides condom negotiation self-efficacy, HIV-related knowledge, and perceptions of HIV transmission/acquisition risk, husbands' alchohol use is another individual-level factor that may increase women's vulnerability to HIV. Gujarat is a "dry" state and its proximity to Mumbai has facilitated the illegal smuggling of alcohol into the state (Rahman & Street, 2002). Though recent crackdowns have curbed the flow of liquor, Gujarat's underground bootlegging industry is booming. Homemade liquor often has a very high alcohol content compared to commercially produced liquor which can be very harmful for the body and can depress sexual inhibition, thereby promoting risky sexual behavior (Rahman & Street, 2002). While the intersection between alcohol use and unprotected sexual behavior is well established in the international literature (Go et

al., 2004; Madhivanan et al., 2005; Schensul, et al., 2006), it is unclear whether husbands curb their use of alcohol after they are diagnosed with HIV, or whether their use is an important factor in understanding sexual risk among serodiscordant couples in Gujarat.

Interpersonal and Socio-cultural determinants of HIV risk

Determinants of HIV transmission risk among married couples go far beyond the individual-level. Disparities between spouses in age, educational attainment, and income may help to explain the "power bases" that influence sexual decision-making and communication which ultimately place women at risk for HIV. Some studies have shown that early marriage or a large age differential place women at a higher risk for IPV, as they may have less autonomy (Allendorf, 2007; Kabeer, 2000; MacQuarrie, 2009). Certainly such factors may influence HIV risk among wives, particularly since IPV is a known risk factor of HIV. Specifically, studies have shown that women who are financially dependent on their husband, or have either more or fewer resources than their husband, have a higher likelihood of experiencing IPV (Bott & Ellsberg, 2005; Macmillan & Gartner, 1999; Yount, 2005; Yount & Carrera, 2006). The direction of the difference, such as more educated women being "status inconsistent," may lead to possible threats to their partner's masculinity which may resort to violence to reassure dominance in the partnership. Women's (much) lower age/schooling may be associated with greater dependence and higher willingness to stay in a violent/serodiscordant couple because they lack alternatives to the marriage. In the case of serodiscordant couples, where a husband is HIV-positive, he may already feel vulnerable and this may

be exacerbated if a wife has more resources (e.g. education, income). This perception may lead to a husband reasserting his power over his wife. However, the effect of spousal disparities on relative power and how it contributes to risky sexual behavior among serodiscordant couples is not well understood.

Relative power among married couples in Gujarat can be understood through traditional gender roles (Kabeer, 2000; Kishor & Gupta, 2004; Kumar, Gupta, & Abraham, 2002; Malhotra, Schuler, & Boender, 2002). Ideal characteristics, gender roles, and responsibilities of husbands and wives are important dimensions to explore, because they may be indicators of power differentials that place women at risk for HIV. According to studies in Rajasthan and Punjab, men's responsibilities were consistently understood as fulfilling three main roles: 1) provider, 2) protector; and 3) procreator. "Provider" pertained to being a hard worker and earning money which provided status to the family. When wives are working or making more money than their husband, it may be considered threatening to a husband's role as the "provider." Additionally, because the role of "procreator" was so closely associated with one's sexuality, sexual weakness was indicative of unmanliness (Dagar, 2002). Having children was considered a masculine ideal and one that brought status to the family. Moreover, 57% of husbands felt having a male child was important. In addition, the husband's "protector" role pertained to controlling their wife's ability to move freely outside of the house (Kumar, et al., 2002). However, it is unclear whether these findings apply to serodiscordant couples. Furthermore, it is unclear the extent to which gender roles shift *or* are maintained after a husband is diagnosed with HIV and whether, for example a

husband's role may include behaviors that are *truly* protective of their wife such as *consistent* condom use.

Women's roles are intended to complement and not to overlap with men's roles. Women's roles include having children, taking care of the family (including husband, children, and in-laws), and domestic labor (including cooking and cleaning) (Kabeer, 2000; Kishor & Gupta, 2004; Kumar, et al., 2002; MacQuarrie, 2009; Malhotra, et al., 2002). In a study of serodiscordant couples in south India, over 40% of wives were willing to risk acquiring HIV to conceive a child (Solomon, et al., 2003); however, it is not known the extent to which husbands were willing to risk transmitting HIV to their wives in order to have a child. In addition, in-laws may have a vested interest in securing grandchildren, particularly sons, to maintain their status in society (Allendorf, 2007; Kabeer, 2000; MacQuarrie, 2009). Daughter-in-laws, in turn, may want to prove their fertility and specifically produce a son to improve their status within the husband's family. Thus, the presence of in-laws may influence sexual risk behaviors among married women in serodiscordant relationships.

For serodiscordant couples, a wife and husband may or may not agree on having children and particularly the use of contraception or condoms. For example, a wife's use of contraception to prevent pregnancy may raise concerns from husbands who suspect infidelity or fear that they may lose their role as "procreator" and head of the family. However, it is unclear how communication and decision-making shift regarding contraception and condom use after the husband is diagnosed with HIV. For example, HIV-infected husbands may see themselves more as the "protector" of the family

(particularly after being diagnosed with HIV) and enforce condom use to both prevent HIV from spreading to their wife and to avert pregnancy.

Few studies have explored cultural norms and gender roles around marriage and expectations around sexual behavior. Arranged marriages, where husbands and wives do not have a say in choosing their spouse, may influence a wife's relationship with her husband and her status in her husband's family. In addition, maintaining a woman's virginity until marriage, as well as passivity and ignorance during sex after marriage, is highly valued in the Indian context (Bhattacharya, 2004; Gupta, 2002; Lambert & Wood, 2005; Schensul, et al., 2006; Solomon, et al., 2003). For example, for many Indian wives, sex is understood as something that is involuntary and initiated by husbands. Even after marriage, references to sex may remain rather indirect. For example, sexual intercourse between married partners in some parts of India is referred to as "milna" ('meeting') or "bat karna" ('conversing') (Lambert & Wood, 2005; Solomon, et al., 2003). However, few studies have explored the terminology used to describe sexual activity, who initiates sex, or the consequences of negotiating safer sex or sex refusal among serodiscordant couples in India.

Intimate partner violence (IPV), such as physical, sexual, and emotional violence is reported to be both a cause and consequence of extramarital sex in South Asia (Silverman, Decker, Kapur, Gupta, & Raj, 2007; Silverman, et al., 2008). Studies in India report that husbands who have extramarital relationships are more likely to be physically and sexually abusive toward their wives (Silverman, et al., 2008). Also, unprotected or coercive sex perpetuated by HIV infected husbands in India can

facilitate transmission of HIV and other STIs to their wives. In a recent analysis of the 2005-2006 Indian National Health and Family Survey (NFHS), married women who experienced IPV reported higher levels of HIV infection compared to those who did not (Silverman, et al., 2008).

Approximately 25% of wives in Gujarat reported a prior experience of physical IPV, 7% reported prior sexual IPV, and 18% reported prior emotional IPV. Moreover, 57% of wives and 74% of husbands in Gujarat felt wife-beating was justified in at least one of seven situations (i.e. either burning the food, disrespecting the in-laws, neglecting the children, suspecting infidelity, arguing with husband, refusing sex, or going out without telling the husband) (IIPS & Macro, 2006). Exposure to IPV or fear of experiencing IPV can deter women from negotiating safer sex or refusing sex altogether (Campbell et al., 2008; Hamburger et al., 2004) .

SIGNIFICANCE OF STUDY SITE

The state of Gujarat lies in the western part of India bordering Pakistan and has a total population of about 43 million people. This study was conducted in the city of Surat in Gujarat state, which is one of India's largest economic centers and the fourth fastest growing city in the world (Bhatt, 2011). The concomitant rise in the populations of intrastate and interstate migrants and commercial sex workers are believed to have contributed to the high HIV prevalence in Surat (Desai et al., 2003; Press Trust of India, 2011; Saggurti et al., 2011). Surat has the highest incidence of HIV in Gujarat (DNA, 2011) and also has one of the largest networks for health and support of HIV-positive people, Network of Surat Positives (NSP+). Surat also has the largest

voluntary counseling and testing center (VCTC) in the state. In the VCTC and NSP+ (Figure 1), approximately 75% of married HIV discordant couples represent instances where the husband is HIV-positive and the wife is HIV-negative; therefore, this population was given research priority (Kosambiya, 2009).

STUDY SIGNIFICANCE AND IMPLICATIONS

Data in India suggest that husband-to-wife transmission of HIV is an emerging mode of transmission (Decker, et al., 2009; Gupta, 2002; Newmann et al., 2000; Solomon, et al., 2003; Solomon, Chakraborty, Yepthomi, & Detels, 2004). However, specific factors that place HIV-negative married women in serodiscordant couples at risk for HIV in India are not well-known. The purpose of this study is to fill this gap with results that can be used to promote the timely development and delivery of prevention interventions for married serodiscordant couples in Gujarat and culturally similar settings in India.

This study is significant for several reasons. HIV incidence in the Indian state of Gujarat and India as a whole is increasing, particularly among married couples (Bhatt, 2011; DNA, 2011; Kosambiya & Desai, 2008; Press Trust of India, 2011). Consistent condom use among married couples is low and HIV-negative women in serodiscordant married partnerships are at continual risk for acquiring HIV when exposed to repeated unprotected sex (Bhattacharya, 2004). In addition, few studies have been conducted on the multiple determinants of sexual risk among married serodiscordant couples in India, and none to our knowledge in Gujarat,. The findings from this research will contribute to the paucity of literature on serodiscordant couples in South Asia, and specifically in

India and the state of Gujarat. Moreover, the findings of this study will help inform the development and refinement of counseling interventions delivered to serodiscordant couples in Gujarat and in India.

CONCEPTUAL FRAMEWORK

The individual, interpersonal, and socio-cultural factors that protect against and put HIV-negative wives at risk for HIV, presented in Figure 1,were supported in the literature. However, these factors had not been previously examined in the Gujarati context with serodiscordant couples. The components presented in the initial conceptual framework (Figure 1) were examined using both qualitative and quantitative methods. In addition, the local cultural context and guidance from a community advisory committee consisting of researchers and HIV service providers informed a complete revision of the conceptual framework (presented in Chapter 2). Moreover, the qualitative in-depth interviews helped uncover specific pathways and processes that both protect against and put HIV-negative wives in serodiscordant relationships at risk for HIV. This step-wise process facilitated our understanding of the range of factors that influence HIV risk among married serodiscordant couples in Gujarat, India which we assessed in the quantitative phase of the study.

OVERVIEW OF RESEARCH AND SUBSEQUENT CHAPTERS

The purpose of this study was to understand the factors contributing to the risk of transmission of HIV to wives in serodiscordant married couples in Gujarat, India. The research project was based on an exploratory mixed-methods design for which both quantitative and qualitative methods were used to extract data on heterosexual

couples where husbands are HIV-positive and their wives are HIV-negative. Subsequent chapters will present main findings from the study. In the second chapter, a qualitative analysis of in-depth interviews with 23 HIV serodiscordant couples (or 46 interviews) is presented to elucidate the factors that protect against HIV and place HIV-negative wives at risk for HIV. In the third chapter, the most unique case from the sample of in-depth interviews is examined. This unique couple presented several risk factors including extramarital relations, inconsistent condom use, sex refusal, and intimate partner violence which, taken together, amplify HIV risk. Building upon the qualitative work presented in chapters two and three, the fourth chapter, a quantitative analysis of 185 serodiscordant couples (or 370 individuals), describes the individual, interpersonal, and behavioral characteristics among HIV serodiscordant couples and the factors associated with inconsistent condom use and sexual decision-making. In the fifth and final chapter, the findings are summarized and concluding remarks are provided.

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Figure 1. Map of Surat

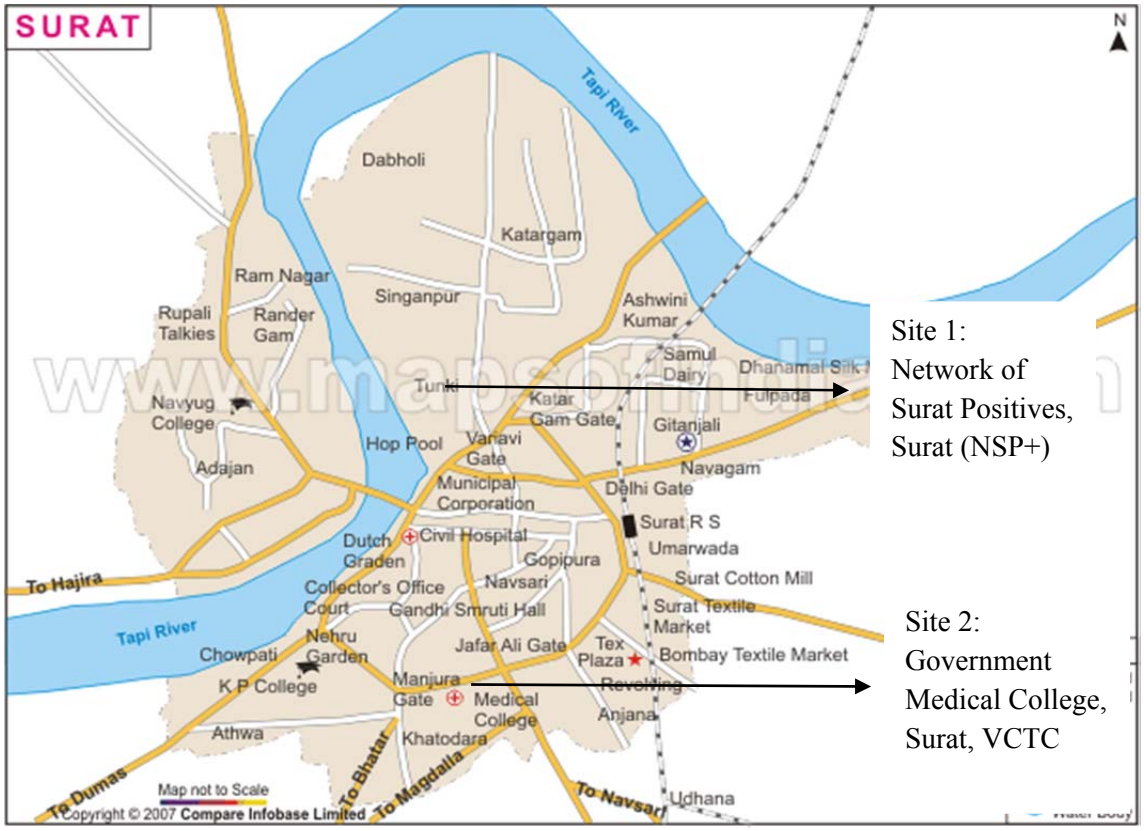
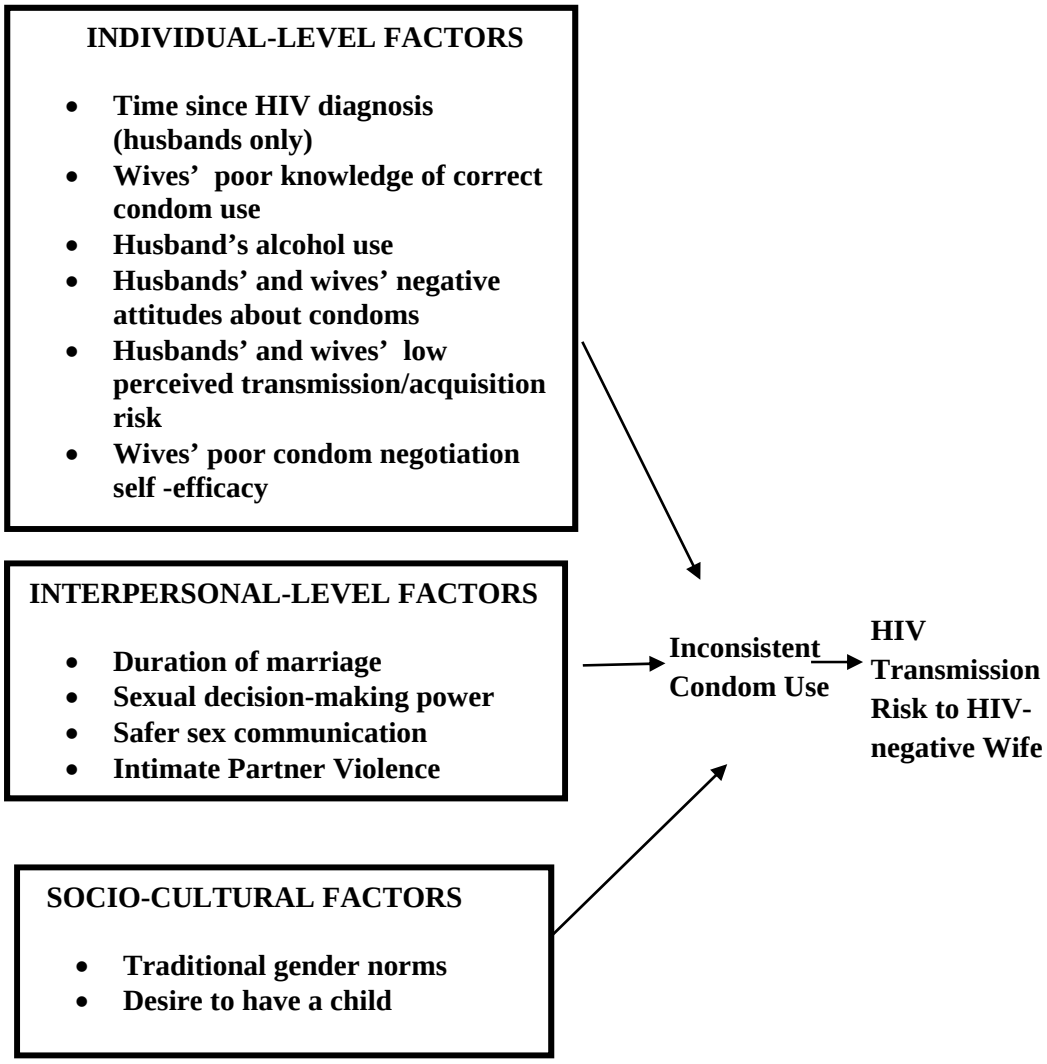


Figure 2. Initial Conceptual Framework: Factors Influencing Sexual Risk Behavior among Married HIV Serodiscordant Couples in Gujarat, India



CHAPTER # 2:

Influences on Sexual Risk among HIV Serodiscordant Couples in Gujarat, India: Results from the Positive Jeevan Saathi Study

ABSTRACT

Introduction: An estimated 40% of new HIV infections occur among married Indian women aged 15-49. Few studies have examined the factors that contribute to HIV transmission risk among HIV-negative wives in serodiscordant married couples in India. No study addresses this issue in the Indian state of Gujarat, a state with one of the largest proportions of new HIV cases in India.

Methods: Qualitative in-depth interviews were conducted with 23 serodiscordant married couples (N=46 individuals) where husbands were HIV-positive and wives were HIV-negative and receiving HIV-related services from two large HIV centers in Gujarat, India. This study examined gender norms and sexual behaviors within the marital relationship that heightened or mitigated risk of HIV transmission.

Results: This study identified key pathways leading to four main sexual behaviors: 1) safer sex; 2) no sex; 3) coercive sex; and 4) unprotected sex. For the majority of couples (N=17) a wife's fear of HIV, couples' positive sex communication, a wife's assertiveness about safer sex or not having sex, mutual respect in relationship, and a husband's desire to protect his wife influenced either having safer sex or abstaining from sex. However, a husband's unfulfilled sexual desire led to extramarital sex which introduced HIV risk to his HIV-negative wife. In addition, desire for children, a husband's excessive alcohol use, intimate partner violence, and condom displeasure increased coercive and unprotected sex.

Conclusions: There is currently no formal counseling program for HIV serodiscordant

couples in India. Developing a counseling program for HIV serodiscordant couples which addresses topics such as sexual fulfillment, safer sex methods, and sex communication; as well as intimate partner violence and alcohol use may be important in preventing risk to HIV-negative wives in serodiscordant relationships.

INTRODUCTION

An estimated 40% of new HIV infections in India occur among married women ages 15-49 years (Silverman, Decker, Saggurti, Balaiah, & Raj, 2008). Given the dominance of heterosexual transmission, understanding the characteristics of a couple that places a married woman at risk for HIV is essential to curb the spread of this epidemic. Few studies, however, have examined the factors that contribute to HIV transmission risk among HIV-negative married women in serodiscordant relationships in India. No study to our knowledge addresses this issue in the Indian state of Gujarat, a state with one of the largest proportions of new HIV cases in India (DNA, 2011; Press Trust of India, 2011). Couple-level aspects, such as marital sex, sexual desire or lack of desire, how sex is refused or avoided, and the consequences of unfulfilled desire; as well as how these dimensions influence sexual risk-taking among wives in HIV serodiscordant relationships need to be explored to help guide HIV prevention programs for couples in India.

In this paper, we explore marital sex and HIV risk among married HIV serodiscordant couples (in which women are HIV-negative) in India through an analysis of in-depth interviews. The focus of this is study is to describe the pathways which may either protect against or place HIV-negative wives at risk for HIV.

BACKGROUND

Couple-level and socio-cultural factors such as lack of sex communication, traditional gender norms, strong desire to have children, and intimate partner violence, (IPV) including emotional, physical, and sexual violence, can contribute to HIV-negative wives' increased susceptibility to HIV/AIDS through unsafe practices, particularly

inconsistent condom use (Bhattacharya, 2004; Godbole & Mehendale, 2005). However it is unclear how underlying dimensions, such as sex desire communication, sex refusal, and unfulfilled sex desire intersect these factors. No studies, to our knowledge, in India have examined how these dimensions, individually or collectively, increase HIV transmission risk among HIV-negative women in serodiscordant couples.

Sex communication among married couples is influenced not only by each individual, but also the interpersonal, socio-cultural, and environmental contexts in which husbands and wives live. Based on traditional gender norms in India, sex is understood to be involuntary and initiated by husbands (Marlow, Tolley, Kohli, & Mehendale, 2010; Pande, Falle, Rathod, Edmeades, & Krishnan, 2011). Wives' references to sex often remain indirect (Joshi, Dhapola, Kurian, & Pelto, 2001), because communication about sex by a wife can raise a husband's suspicions of his wife's prior sex experiences (Pande, et al., 2011). A study in Bangalore, however, found that some husbands were receptive to female-initiated sex communication, as it would allow husbands "sexual access" to their wives and potentially avert their wives' refusal of sex (McDougall, Edmeades, & Krishnan, 2011). In addition, one study in Gujarat showed that some married women enjoyed marital sex (Joshi, et al., 2001), but another study showed that more married women express a lack of sexual desire than they express sexual desire (McDougall, et al., 2011). However, one member's serodiscordance may motivate greater communication about sexual desire and refusal by a husband or a wife.

Globally, some studies have shown that an HIV-negative female partner can successfully assert herself and negotiate condom use (for example, see Orengo-Aguayo

& Pérez-Jiménez, 2009 and Perez-Jimenez 2009), whereas other studies have shown that sex refusal by a female partner can lead to unprotected, coercive sex (Emusu et al., 2009; Van der Straten et al., 1998). Studies of married women in India show that their ability to refuse sex is constrained by traditional gender norms about women's sexual passivity and men's strong sexual desire (Joshi, et al., 2001). Such gender norms and interpersonal dynamics can contribute to coercive sex. However, one small qualitative study of heterosexual serodiscordant couples in Puerto Rico showed that HIV-negative women become more verbally assertive about condom use and HIV-positive men became more supportive of safer sex (Orengo-Aguayo & Pérez-Jiménez, 2009). However, in another study of heterosexual HIV serodiscordant couples in Uganda, male resistance to condom use was noted. For example, women's verbal assertiveness and push for condom use led to the reassertion of male dominance in the relationship in the form of sexual IPV and other controlling behaviors (Emusu, et al., 2009). Even so, it is unclear how these shifts in traditional gender norms contribute to HIV risk or protect against HIV risk among HIV-negative wives in serodiscordant relationships in India.

Alcohol use is also a major contributor to unprotected, coerced sex (Go et al., 2004; Schensul et al., 2006). While the correlation between alcohol use and unprotected sexual behavior is well established (Madhivanan et al., 2005; Schensul, et al., 2006), it is unclear whether husbands curb their alcohol use after an HIV diagnosis or whether wives avoid or refuse sex when their husbands are intoxicated.

Condom use is generally low among spouses because of an implicit understanding that marriage is a monogamous relationship. The desire to have children

also makes condom use unappealing for many married couples. While studies show that HIV serodiscordant couples engage in unprotected sex to become pregnant (Beyeza-Kashesya et al., 2009; Rispel, Metcalf, Moody, Cloete, & Caswell, 2011), it is unclear whether some HIV-positive husbands avoid sex and engage in *consistent* condom use to protect their wives against HIV even when the desire for pregnancy emerges. Wives also may be fearful of contracting HIV and adopt strategies to avoid/refuse sex or perform it more safely.

Gender norms in India sanction men's extramarital relations. Studies in India have shown that married men engage in extramarital relations due to sexual dissatisfaction in marriage (Schensul, et al., 2006; Schensul, Verma, & Nastasi, 2004) while maintaining a double standard that extramarital relations are improper or immoral for wives (Go et al., 2003). In a qualitative study of married women in Gujarat, some women succumbed to husband's sexual desires despite their own lack of desire due to a fear that their husbands would engage in extramarital relations if they did not meet their sexual needs (Joshi, et al., 2001). However, it is unclear how HIV serodiscordant couples respond to unfulfilled sexual desire and whether husbands and wives engage in extramarital relations due to sexual dissatisfaction in their marriage or because they want to protect their marital partner from HIV.

The pathways and the processes that underlie safer sex, no sex, coercive sex, and unprotected sex, such as traditional gender norms, sexual desire communication, fear of HIV, sex refusal, and the consequences of unfulfilled sexual desire will be discussed in this paper.

METHODS

Study Setting

Surat, Gujarat, the study location, has the highest prevalence of HIV in the state of Gujarat (DNA, 2011; Press Trust of India, 2011). Surat is also one of India's largest economic centers and the fourth fastest growing city in the world (Bhatt, 2011). The concomitant rises in migrant and commercial sex workers are key factors that are believed to have influenced HIV transmission in Surat in recent years (Desai et al., 2003; Press Trust of India, 2011; Saggurti et al., 2011). Surat has the largest health and support network for HIV-positive people (NSP+) in Gujarat as well as the largest voluntary counseling and testing center (VCTC). Approximately 75% of married, HIV serodiscordant couples from the NSP+ and VCTC in Surat represent cases where husbands are HIV-positive and wives are HIV-negative (Kosambiya, 2009), hence these couples were given research priority.

Participant Selection

Over a ten-month period from February 2010 to November 2010 we recruited 23 married, serodiscordant couples (23 HIV-negative wives and their 23 HIV-positive husbands, for a total of 46 individuals) for in-depth interviews (IDIs) from the VCTC and NSP+ in Surat. We implemented a two-step recruitment process. Data was analyzed from the first 18 couples interviewed to identify key factors that protect wives against HIV or place them at risk for HIV. An additional five couples were then recruited to fill in gaps in the data, for a total of 23 couples.

Couples were eligible for the study if they: 1) were serodiscordant with the wife being HIV-negative based on HIV tests for both partners in the past year; 2) were married

for at least six months; 3) had marital sex in the past six months; 4) were recruited through the VCTC or NSP+ in Surat; and 5) were both 18 years of age or older. The two centers had a similar clientele demographically, except that NSP+ had more Gujarati-speaking clients. Couples were intentionally recruited from each site on alternating days during the recruitment period to ensure couples from both sites were included. To include varied experiences in the sample, we also sought to recruit couples with diverse attributes including those who were recently married and those who had been married for a longer period; those who had children and those who did not have children; and those who had been living with HIV for a longer time and those who were diagnosed with HIV more recently.

To avoid a potential breach of confidentiality, only *index partners*--those husbands who were confirmed by counselors or outreach workers of the VCTC and NSP+ as being HIV-positive and in a serodiscordant relationship--were referred to assess interest in the study and screen for eligibility. Research staff then approached the HIV-positive husbands to assess their interest in the study. If the wife was not present during the initial approach, the husband would ask his wife about her interest in participating. If she also was interested, she contacted the research staff to be screened for the study. If both partners met the eligibility criteria, they each completed a formal consent process in which they were asked for permission to audio-record their interview. Husbands and wives were interviewed in separate rooms at the VCTC or NSP+ to ensure privacy by gender-matched staff in either one of two local languages, Gujarati or Hindi.

Seventy-one index partners in HIV serodiscordant relationships were approached by research staff. Of these index partners, 40 were not screened because

one partner was not interested in the study or did not have time to participate. There were 31 couples who agreed to be screened for the study; 8 were ineligible as they had not had marital sex in the past six months, and 23 (32%) of husband-wife dyads were eligible and enrolled in the study. Husbands and wives received a small meal and 150 rupees each to defray lost wages and transportation costs attributed to study participation. This study was approved by the Research Ethics Committee at the Government Medical College, Surat and by the Emory University Institutional Review Board.

Study Instruments and Training

The in-depth interview guides were developed by researchers in India and the U.S. to ensure inclusion of culturally-sensitive perspectives and appropriate translation. Four research assistants received training on research ethics, qualitative research, administering interviews, and other data collection and storage procedures. We pilot tested the instruments with three couples, and after each set of interviews, the research assistants and the first author discussed the challenges they faced during the interviews, such as wording of questions and potential gaps in information, as well as compared husbands' and wives' responses.

To build rapport, each in-depth interview began with general topics and as the interview progressed, more detailed perspectives were elicited, for example, "Tell me how you came to know about your HIV status/husband's HIV status?" and "What are things you like/find disappointing about your marriage?." These types of questions were followed by more sensitive questions on sexual desire, avoidance or refusal of sex, and fulfilled or unfulfilled sexual desire.

All 46 in-depth interviews were transcribed verbatim in either Gujarati or Hindi, and then translated into English. To ensure quality of transcriptions and their translations, interviews were randomly selected in couple units and reviewed and corrected by the research team on a weekly basis. Translated textual data were imported into MAXQDA® 2010, a qualitative software program (Marberg, Germany) to facilitate the manipulation of textual data for analysis.

Data Analysis

Textual data were coded within couples (because spouses were paired), for general themes related to marital intimacy and HIV risk, and guided by a modified grounded theory approach (Leonard & McAdam, 2001). Using open coding, each transcript was reviewed line-by-line to discover new concepts, and a preliminary codebook was developed. Themes found to be salient regarding marital intimacy and HIV risk were organized into categories and codes and sub-codes were organized under these categories. Inter-coder reliability was assessed during this initial phase to ensure the robustness of the coding and emergent themes, 95% of the coding agreed. In later phases of coding, we used axial coding, the process of relating codes and categories to each other. In addition, generating memos and thick descriptions was a critical step in analysis, helping to explicate the codes and categories as well as describe the intersections and relationships between codes and categories (Corbin & Strauss, 2008). Moreover, constant comparisons between the codes and categories helped advance the conceptual understanding of factors that protect HIV-negative wives against HIV as well as place them at risk for HIV. The comparisons also helped identify whether or not there were patterns across codes and categories based on couple-level attributes. Lastly, the

gaps in the data prompted the first author to "interrogate the data" and search for supporting evidence and counter-evidence on factors that protect against HIV and promote sexual risk, including mutual and differential sexual desire, sex avoidance/refusal strategies, consequences of unfulfilled desire, and HIV risk. Once this process was completed, we performed a *final reliability exercise*. For this exercise, another couple (two transcripts) was randomly selected for the independent coder. Once each transcript was coded, the first author and independent coder met to discuss discrepancies and refinements. About 95% of the matched and once consensus was achieved on discrepant coding, a final codebook was created.

RESULTS

Characteristics of Participants

On average, couples in this study had been married for 13 years (range 1-27 years), had two children, and the husband had been living with HIV for 4.4 years (Table 1). In addition, most women did not know about the HIV status of their husband before marriage and only one couple had conceived a child after HIV disclosure. While the majority of couples reported consistent condom use (n=17) and avoided sexual risk behaviors, there was some situational variation influencing unsafe sex. A substantial minority (n=6) of couples reported inconsistent condom use with their spouse due to condom displeasure, pregnancy desire, sexual violence, or alcohol use. Six husbands reported that they had current extramarital partners with either women or men at the time of the interview which they attributed to unfulfilled sexual desire in their marriage. Only one wife reported extramarital relations, specifically transactional sex, due to financial need.

Conceptual Framework

Empirical data from this study identified five main pathways by which gender norms influenced the main sexual behaviors at issue: 1) safer sex; 2) no sex; 3) coercive sex; and 4) unprotected sex. These pathways and behaviors are shown in the conceptual framework in Figure 3 and are described in detail below. Traditional gender norms of husbands and wives influence sex desire and communication of sex which influence the respective pathways and sexual behavior outcomes. While gender norms and sex communication affect all of the pathways below it, we focus only on the most proximal influences on the pathways and sex behavior outcomes. In addition, the left of the conceptual framework highlights the first two pathways leading to sexual behaviors that reduce the risk of HIV transmission, safer sex, and no sex. The key influences on these two pathways included fear of HIV, desire to protect partner or self, and mutual respect about sex. Both of these sex behavior outcomes protect wives against HIV transmission. However, safer sex and no sex contributed to unfulfilled sexual desire which at times led to extramarital sex and placed a wife as well as non-marital partners at risk of HIV. This dynamic represents an additional pathway to HIV risk. Moreover, the third and fourth pathways (i.e. middle pathway) show that a woman's refusal or avoidance of sex leads to no sex or coercive sex, respectively. The fifth and final pathway shown on the right side of the conceptual framework leads to unprotected sex, which is typically the result of IPV, husband's alcohol use, and desire to have children. Unprotected, coercive sex committed by husbands also influences risk to HIV-negative wives.

Gender Norms, Sex Desire and Communication of Sex

As presented at the top of Figure 3, gender norms of husbands and wives influenced sex desire and communication of sex. Sex desire and communication of sex, in turn, influences sex behaviors through the five main pathways. The example below shows how gender norms influence sexual desire and communication of sex.

One Muslim couple felt strongly about norms surrounding sex and communication about sex. According to the couple, these norms were rooted in their cultural and religious beliefs. The husband who had been living with HIV for eight years shared:

P: The wife can never say [that she desires sex] in our [Muslim] community. I think only 10% wives will offer themselves for sex and 90 % ladies will not offer for sex.
I: Does your wife take the initiative in telling you?
P: She never tells me that. Sometimes when I tell her she refuses me and says that it would be better to have as less sex as possible... If the husband asks for ornaments, or if he asks for a car then she has the right to refuse, but if the husband asks for sexual relations then she cannot refuse it. If she does so, she will be committing a sin…but now [after HIV] whenever I have [sexual] relation with my wife I use a condom (1023 husband, two children, married for 12 years, 34 years old).

The sentiment of the wife in this couple paralleled that of her husband. She expressed her feelings about sexual norms and communication in the following way:

It has never happened in that way [where wife says she wishes for sex]. In our community it is based on the husband's wish whether it is day or night. It happens according to his wish to have [sex] relations. Whenever the husband says to have [sex] you must do so whether it is day or night. Otherwise in our religion it is considered a sin (1024 wife, married for 12 years, two children, and 25 years old).

In this couple, both husband and wife felt it was inappropriate for wives to express a desire for sex and to refuse sex due to norms surrounding sex and sex communication.

Despite these norms, this couple adopted safer sex practices after HIV entered their lives, as did many other couples in the sample.

Influences on Safer Sex and No Sex

The first and most common pathway between husbands and wives after HIV entered their lives was safer sex. Although couples desired sex, the presence of HIV led most (N=17) to practice safer sex, such as masturbation and condom use, with their spouse. The second pathway in Figure 3 led to no sex whereby a wife refused to have sex with her husband or couples chose to abstain from sex for periods of time. Both safer sex and not having sex were behavioral outcomes which protected wives against HIV. Common influences on safer sex and not having sex included mutual respect or understanding about sex, positive sex communication, wives' assertiveness about safer sex or not having sex, fear of transmission or acquisition of HIV, and a determination to prevent HIV transmission.

One of the main influences on practicing safer sex and not having sex was mutual respect for one another which involved positive communication about sexual needs and protective behavior. Many couples (N=13) expressed a mutual respect for one another which influenced their practice of safer sex or not having sex during the period after the husband was diagnosed with HIV. For example, when either the husband or wife wanted to use condoms or refused sex, the other partner reportedly agreed. One husband who was diagnosed with HIV three years ago shared his experience:

Sometimes it happens that we have sex with a condom and sometimes we do not have sex. If there is sickness or the body is paining [I do not have sex]. If I ask her one or two times and she refuses, then we do not have [sex]. There is an understanding with us (1013; husband, one child, married for 10 years, 29 years old).

His wife discussed her experience with her husband:

P: Sometimes there is a wish to have sex and we have sex with a [condom] sometimes I feel sleepy, and then we sleep [and do not have sex].
I: Whenever your husband desires to have relation what happens then?
P: Nothing, I just say 'no, not today, I feel sleepy'. I go to sleep; he does not force himself upon me.
P: If he has desire and I do not have a desire, what can be done? I have to say no to him. After that he remains by himself and does not [bother me]. I have to live accordingly and so does he (1014; wife, one child, married for 10 years, 27 years old).

Further influences on safer sex and no sex, included wife's fear of HIV, a desire by the husband to protect his wife against HIV, and a desire by the wife to protect herself against HIV. In one couple, both the husband and wife engaged in consistent condom use and decreased their sexual frequency after the husband was diagnosed with HIV, despite having no children. The wife spoke about her sexual relationship with her husband and her fear of contracting HIV:

Before [HIV] he did not refuse me, meaning if I say I wanted to have [sex] he never refused me. Even if it was his wish or not if I told him he did not refuse me. Right now, we come together [for sex] just 4 to 5 times in the year. Now, he also refuses that and even I refuse it [sex]. If one has this [HIV] one can spread the disease, so I just avoid it [sex] (1036; wife, married for 16 years, no children, 36 years of age).

While the wife shared her fear of HIV, her husband, who was diagnosed with HIV seven months ago, also described a desire to engage in safer sex as he wanted to protect his wife.

I: What do you do now if you wish for sex?
P: I use my hand [masturbate]….My life is spoilt and I do not want to spoil my wife's life.
I: I also fulfill my wishes in other ways…
I: In what ways?
P: If I see a man I wish to have sex [without a condom]. Sometimes I go to the paan shop and I meet people there. Sometimes if someone stops we talk to them and then we do the work [sex] (1035; husband; married for 16 years, no children 42 years of age).

The wife expressed her fears of acquiring HIV and wanted to protect herself, thus decreasing her sexual frequency with her husband. The husband engaged in safer sex because he wanted to protect his wife; however, despite his good intentions, his unfulfilled sexual desire contributed to unprotected, extramarital relations with other men. Several husbands (N=6) reported extramarital relations due to unfulfilled desire. Such behaviors could lead to acquisition of other STIs that would increase HIV risk to HIV-negative wives as well as risk to other non-marital partners (Figure 3).

Although the consequence of having safer sex or abstaining from sex was unfulfilled sexual desire, not all cases of unfulfilled desire led to extramarital relations, such as in the couple presented above (Figure 3). For example, one wife expressed that she was sexually unfulfilled sometimes as a result of her husband refusing sex:

P: He keeps me happy in sexual relations and I also keep him happy. He sometimes disappoints me [about sex] and sometimes he agrees to relations.
I: You get disappointed sometimes so tell me an incident like that.
P: One week earlier I had a wish but he had come home tired, so he did not have a wish [for sex]. I told him and he refused me. He said I am feeling sleepy. I am feeling tired….so I accepted it and killed my desire. I say his health is not good, so never mind (1042; wife, married for 2.5 years, one child, 29 years old).

The husband, who had been diagnosed with HIV 2.5 years ago, explained his situation in this way:

Sometimes she asks why don't you want to have [sex] and I say that I am tired, so she angrily says ok. When I do not want to have sex, I directly tell her that my body is hurting. I cannot have sex with you right now because my body is hurting. I am tired today….When I refuse her there is a little quarrel… and then after that she sleeps… (1041; husband, married for 2.5 years, one child, 32 years old).

As indicated above, although the wife felt sexually unfulfilled at times, it did not result in her engaging in extramarital affairs.

Influences of Refusal and Avoidance of Sex on No Sex and Coercive Sex

The third and fourth pathways show that for some couples the refusal to have sex or avoidance of sex led to no sex or coercive sex, respectively (see middle of Figure 3). There were several influences on sex avoidance or refusal, including alcohol use and IPV. Husbands' alcohol use and IPV affected the ability of some wives to avoid sex after their husbands were diagnosed with HIV, leading to either no sex or coercive sex. One husband who had been diagnosed with HIV for nine years described his behavior:

I will tell the truth. First I got to know that I have got HIV, and then I started drinking a peg [of alcohol] slowly and secretly. Six months went by that way then I told her and then drinking it became a habit. When I drink there is always quarrel in the family. I believe because of this, there are quarrels in the family about sexual relations (1001; husband, married for 16 years, one child, 41 years old).

The wife described strategies she used to avoid sex when her husband was drunk:

He drinks because of tension… Anything he has in hand he hits me with it and [when] he wakes up in the morning he asks, did I do anything [to you]? ….When he drinks in excess then usually at that time he tells me [to have sex] without using a condom but I just go to sleep. I refuse him by giving him tea or lime [water] to him. His drunkenness decreases in that way. What is the use of having unsafe [sex] and then crying over it later? [He] then says why should we use a condom? Come here for [sex] then I go and quickly make tea for him. I say I don't wish to have [sex with you] today, my head is hurting [or] my leg is hurting.…If he still coerces me, I tell him that we will wake up the child [by having sex] (1002; wife, married for 16 years, one child, 38 years old).

This wife described her challenges in avoiding sex primarily because of her husband's alcohol use and abusive ways. As presented above, the wife used both verbal and non-verbal strategies to avoid unsafe sex. However, despite the wife's best efforts to avoid unsafe sex, she occasionally fell victim to coercive sex when the husband was

intoxicated. The husband did not elaborate on his behaviors, but mentioned that "quarrels" arose with his wife because of his drinking.

Influences on Coercive Sex

A direct pathway leading to HIV risk for HIV-negative wives was through coercive sex, the fourth pathway depicted in Figure 3. Three couples reported coercive sex after HIV entered their lives, despite the wives' attempts to refuse sex and protect themselves. In one couple, the husband who had been diagnosed with HIV two years ago described his reaction when his wife refused to have sex:

P: She goes away; she avoids it…
I: What do you say at that time?
P: I do not always make her agree to it [sex]. She says let us not have [sex] if the children are awake. Have sex tomorrow or day after tomorrow…
When I tell her she keeps refusing to have [sex] and at that time I have [sex] with her forcefully. (1047; husband, married for 20 years, five children, 40 years old).

The wife confirmed her husband's reaction after she refused sex:

I: How do you avoid sex when your husband wants to have [sex] and you do not want to have it?
P: He does not avoid it. I try to avoid it by reasoning with him, but even then he has [sex] with me forcefully. (1048; wife, married for 20 years, five children, 40 years old).

In this case, the wife tried to verbally assert herself and reason with her husband, but still fell victim to unprotected, coercive sex.

Influences on Unprotected Sex

The fifth and final pathway led to unprotected sex and therefore HIV risk for HIV-negative wives (left side of Figure 3). Several couples (N=6) reported unprotected marital sex. There were several influences on unprotected sex including condom

displeasure, desire for children, IPV, and alcohol use. For example, in one couple, both condom displeasure and desire for children were reported as reasons for unprotected sex. The husband who was married for two years revealed his HIV status just one day before their marriage and had one child after HIV disclosure. The husband explained his desire for unprotected sex and displeasure for condom use in this way:

P: Because to put a condom on or not is my desire. She agrees if I say that let us come together [and have sex] using a condom and if we want to have [sex] without condom, she even agrees to that.
I: If you refuse a condom what will she say?
P: She will not say anything. She will agree even then [to sex] (1037; husband, married for nine years, one child, 29 years old).

His wife spoke about her desire for unprotected sex due to condom displeasure as well as desire to have a child:

P: He [husband] also does not like to have [sex] with condoms. I refuse it [sex with condoms] because I don't like it [condoms], but sometimes we use [condoms], but I say I do not like it, it is better that we stay without it [sex]. If we have a lot of wish he says that nothing will happen, so at that time I feel that if he has a lot of wish I should not refuse him. When I use a condom I do not feel good from within, otherwise I still wish for another child (1038; wife, married for nine years, one child, 27 years old).

While condom displeasure was a reason for inconsistent condom use given by both husband and wife, the desire to have another child was an additional underlying reason for the wife's desire for unprotected sex. This example illustrated factors that influence the pathway leading to unprotected sex and ultimately HIV risk for HIV-negative wives (Figure 3).

Some couples (N=4) described the violence that arose when wives wanted to use a condom and their husbands desired unprotected sex. One wife recounted an instance in

which she asserted herself and pushed for condom use, but at the cost of facing intimate partner violence:

He agrees when I tell him to use a condom, but sometimes there is a fight [hitting] about it. Let the hitting happen. It should not happen that for one mistake both our lives get spoilt. If he wants to enjoy then [he should] leave my house and children and go to enjoy himself. Why does he want to spoil our life? Sometimes there is a fight between the husband and the wife no matter how loving you are to them (1010; wife, married for 16 years, two children, 36 years old).

Her husband, who had been living with HIV for three years, denied having unprotected sex with his wife or committing IPV because of his desire for sex after his HIV diagnosis:

I: Do you have [sex] without using a condom after HIV with your wife?
P: I have never done that in my life…I masturbate in the fields or in the manger if I have a desire. She also fasts a lot during religious festivals so I tell her to make me masturbate so she takes me to the bathroom and she makes me masturbate. Then she also stays in peace and I also stay in peace.
I: Does she tell you to use a condom?
P: Yes. She brings the condom herself….before [HIV] I pressured her [to have sex]. Even if she did not wish [to have sex] I did apply force.
I: Do you do that after you came to know about your HIV?
P: I do not have [sex] forcefully with her now (1009; husband, married for 16 years, two children, 39 years old).

In this case, despite the wife's assertiveness to use condoms, she admitted that she fell victim to violence at times. While the husband admitted to committing IPV prior to HIV, he denied having committed IPV and pushing for unprotected sex after his HIV diagnosis. This pathway illustrated another route leading to risk for HIV-negative wives.

DISCUSSION

Main Findings

Overall, the majority of couples engaged in consistent condom use regardless of number of children, marital duration, and time since living with HIV. No singular pattern

was noted across HIV serodiscordant couples based on these attributes which may have important implications for intervention development. We identified five main pathways that protected against and placed wives at risk for HIV; however, there was variation and complexity within the pathways which influenced risk among husbands and wives in couples. The factors that protected wives against HIV were fear of contracting HIV, mutual respect regarding sex, positive sex communication, wife's desire to protect self, and husband's desire to protect his HIV-negative wife.

This study revealed several factors which contributed to pathways leading to four respective sex behavior outcomes which had not been described previously among HIV serodiscordant couples in India. Not having sex and safer sex led to unfulfilled sexual desire which contributed to extramarital relations. While most husbands sought extramarital partners as a sexual outlet for unfulfilled desire, some of these husbands considered extramarital affairs a method of protecting their wives against HIV. However, this concern did not extend to extramarital partners and ultimately influenced HIV risk to both HIV-negative wives and non-marital partners. Lastly, sex refusal and avoidance contributed to not having sex and coercive sex which influenced HIV risk to HIV-negative wives.

The study also revealed that while some HIV-positive husbands and HIV-negative wives assumed traditional gender norms or stated that they subscribed to these norms, many deviated from these norms for varied reasons. Among some couples, wives' passivity regarding sex and indirect references to sex were replaced by non-traditional behaviors such as assertiveness about sex refusal and verbal demands to use condoms which promoted protection against HIV. A very small study of serodiscordant couples in

Puerto Rico showed that some HIV-negative female partners maintained traditional gender roles, while others adopted non-traditional roles and were more vocal in their insistence on safe sex practices (Orengo-Aguayo & Pérez-Jiménez, 2009).

In our study, the vast majority of couples engaged in safer sex. In fact, some husbands who mostly initiated and demanded sex before they were diagnosed with HIV adopted a mutual understanding with their wives about sex after their HIV diagnosis. The findings regarding positive sex communication among couples in this study were consistent with previous studies that have also found that effective communication skills, including confidence in speaking to partners about sex, were associated with condom use and safer sexual practices (McGrath et al., 2007; Padian, Shiboski, Glass, & Vittinghoff, 1997). Moreover, most HIV-positive husbands were motivated to use condoms and acquiesced to their wives' demands of condom use because they viewed their role as "protector" of the wife, a finding consistent with studies in India and elsewhere, which have found the role of "protector" traditionally assigned to men (Dagar, 2002; Orengo-Aguayo & Pérez-Jiménez, 2009). Similarly, some couples in which the husband mostly initiated and demanded sex before HIV diagnosis adopted a more egalitarian role with their wives about sex after their HIV diagnosis. However, patterns of relationship dynamics post-HIV diagnosis were not consistent.

We found that a substantial minority of husbands reacted violently to their wives' demands of condom use or sex refusal. In our study, discordance in some couples' responses suggest communication may be low among these couples. In addition, the inability to accept sex refusal due to traditional gender norms surrounding sex and sex communication undermined the ability to negotiate safe and desired sex. Given these

norms, emphasis needs to be placed on relationship dynamics such as enhancing couples' communication as well as support and trust in relationships. Doing so may help promote a modification to male-dominated sexual communication and thereby mutual respect and protection against HIV.

IPV and problem drinking also exacerbated HIV risk in this study. Problem-drinking can also affect adherence to antiretroviral therapy which can increase both viral load and transmissibility of the virus to the HIV-negative partner (Chander, Lau, & Moore, 2006). Counselors need to be trained to sensitively assess for and counsel on IPV and problem drinking on an ongoing basis because it may not surface during the first visit.

Study Limitations

There were three main limitations of this study. First, since the vast majority of serodiscordant couples in Surat were where husbands were HIV-positive and wives were HIV-negative, we did not include the opposite dyad (where husbands are HIV-negative and wives are HIV-positive) which represents 25% of couples in the area. While these couples are also important to study, we decided to focus on couples where HIV risk was the highest. Second, we recruited our sample through sites that provided services to people living with HIV, thus study participants were more likely to have had access to counseling and other HIV related services prior to the interview. While this limited the generalizability of our findings, this was the only ethical method identified to recruit HIV serodiscordant couples without the potential breach of confidentiality to the HIV-negative wives. Lastly, due to the sensitive nature of the questions, items on sexual behavior may have caused some social desirability bias in husbands' and wives' responses.

CONCLUSIONS

The study highlighted the main pathways that contributed to both protective and risky sexual behaviors, but more research is needed to understand why some couples can modify behaviors and relationship dynamics positively, while others do not change or change for the worse. Given that HIV serodiscordant couples may encounter challenges early and across the life course, targeting topics such as condom displeasure, sex refusal, and unfulfilled sexual desire, even in couples who are not currently experiencing these challenges, may help protect HIV-negative partners against HIV risk. Developing a couples counseling program that addresses such topics may be critical to protect HIV-negative wives from contracting HIV.

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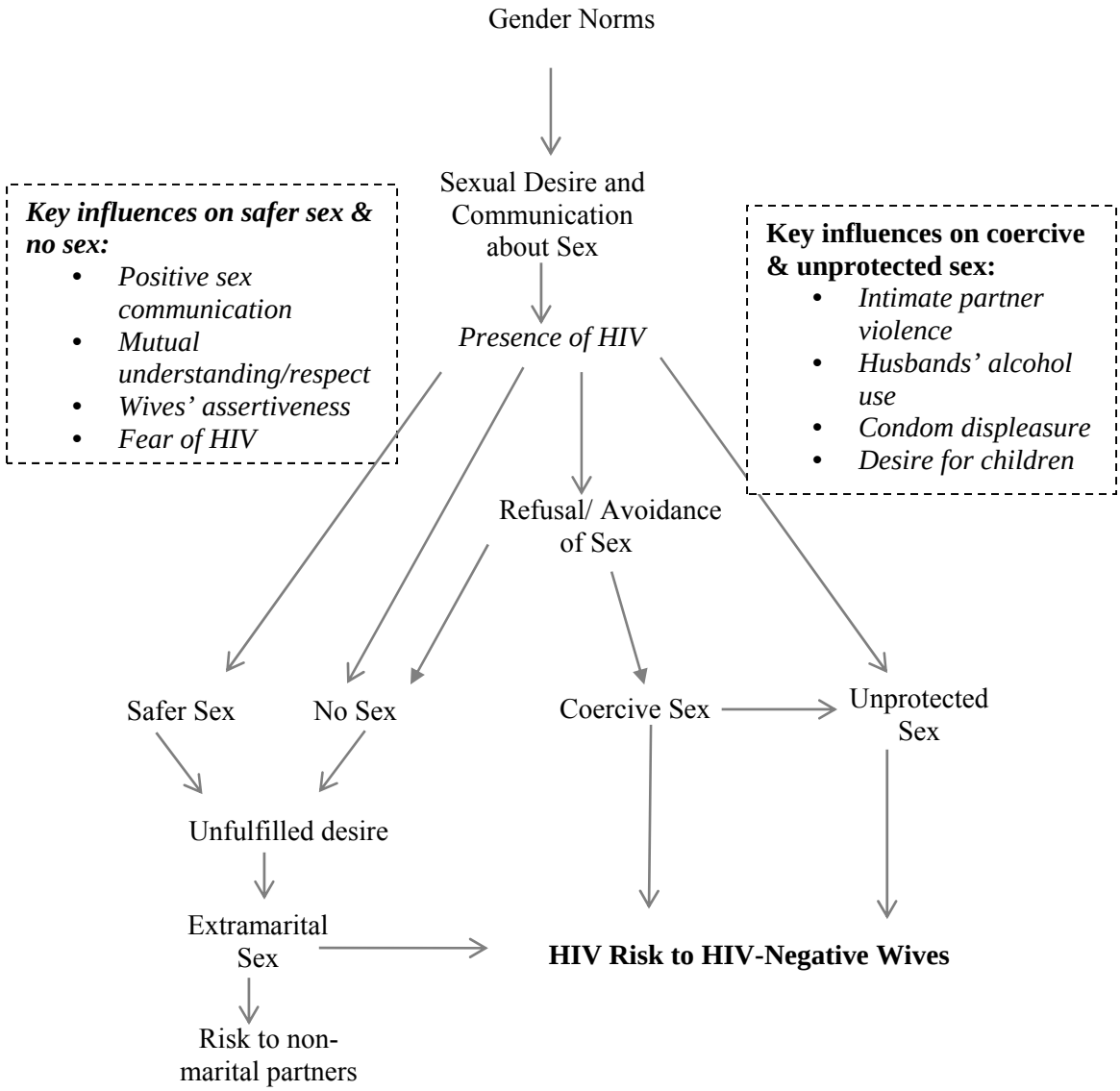
Table 1. Socio-demographic Characteristics of HIV Serodiscordant Couples from Gujarat, India

Characteristics	Wives	Husbands	Couple level*
Age			
18-25	5	0	--
26-35	13	13	--
36+	5	10	--
Highest Education Level			
Illiterate	4	4	--
Primary	7	5	--
Secondary	9	13	--
Higher Secondary	3	1	--
College and higher	1	0	--
Religion			
Hindu	20	20	--
Muslim	3	3	--
Diagnosed with HIV (average years)	--	4.4	--
Average household monthly income (in rupees)*			5,500
Marriage Duration*			
≤3 years			3
4-9 years			3
>10 years			17
Marriage Type*			
Arranged			19
"Love"			4
No. of Children*			
None			3
1			8
≥2			12
Family Type*			
Nuclear			14
Joint/Extended			9

Figure 3. Main Pathways that Protect Against and Put Wives At Risk among Married HIV Serodiscordant Couples in Gujarat, India



CHAPTER #3

He Said, She Said: A Case Study on the Relationship Dynamics and Challenges of Safer Sex among a HIV Serodiscordant Couple in Gujarat, India

ABSTRACT

Introduction: Globally, mounting evidence suggests that the greatest risk for HIV transmission among women lies within marital relationships, a fact that has not been fully incorporated into HIV prevention programs in India. Research in India suggests that HIV-negative women in serodiscordant relationships have a higher risk for acquiring HIV, compared with HIV-negative men. However, few studies have examined the factors that influence HIV transmission risk among HIV-negative married women in India, and there is currently no study to our knowledge that addresses this issue in the Indian state of Gujarat where HIV incidence is increasing.

Methods: One-on-one, in-depth interviews were conducted with HIV serodiscordant, married couples receiving HIV related services in Surat, Gujarat. From these interviews, one unique case was explicated and presented. A case summary and the main factors that exacerbate HIV risk, including extramarital relations, inconsistent condom use, and how sex refusal contributed to IPV in the selected couple, are explored.

Results: Situational variation existed in the case discussed. Although there were improvements in the couple's relationship after HIV entered their lives, shifts in relationship dynamics and behaviors exacerbated HIV risk.

Conclusions: Early and ongoing counseling interventions with couples are key, as relationship dynamics and behaviors can change over time. HIV service providers must

be trained appropriately to address the spectrum of risk that may lie in HIV serodiscordant couples.

INTRODUCTION

India has the third largest number of HIV cases in the world with an estimated 2.5 million infected individuals and 80% of infections believed to be transmitted heterosexually (HIV, 2008). Understanding the relationship dynamics of heterosexual married couples is essential to curb the spread of this epidemic. Specifically, prevention programs targeting both people living with HIV/AIDS (PLWHA) and their spouses are critical in reducing the spread of the virus, especially when the partners are serodiscordant—one partner is HIV-positive and the other is HIV-negative. Little research has been done to explore marital sex and the interpersonal factors that increase HIV risk among husbands and wives in serodiscordant relationships in India. Moreover, no research has been done in the state of Gujarat which accounts for a growing number of new cases of HIV in India. Given India's considerable diversity, *local* factors that contribute to risk among serodiscordant couples need to be understood by HIV service providers.

Prevention among HIV serodiscordant couples has not been included in either national or local HIV prevention strategies in India, thus more case studies illustrating the unique challenges of these couples to prevent transmission should be explored to understand the needs of this population. In this paper, we will discuss one married, serodiscordant couple who highlight the challenges and relationship dynamics influencing HIV risk behaviors.

BACKGROUND

Several factors contribute to inconsistent condom use in India. Couple-level and socio-cultural factors, such as traditional gender norms, intimate partner violence (IPV), unfulfilled sexual desire, and extramarital relations, contribute to HIV-negative wives' increased susceptibility to HIV/AIDS (Patel et al., 2011). Inequities in the expected or ascribed gender roles of husbands and wives are important dimensions to explore, as they may be indicators of power differentials that place wives at risk for HIV. According to a study in Punjab, men's responsibilities are understood as fulfilling such roles as financial "provider" and "protector" of the family (Dagar, 2002). "Provider" pertained to being a hard worker and earning money, enabling the family to meet its basic needs provided status to it. In couples in which wives are working or making more money than the husband, this circumstance may be considered threatening to a husband's role as the "provider." In addition, husbands also valued their roles as "protector" of the family. For example, knowing and controlling family's whereabouts was a part of this protective role. However, for HIV-positive husbands, this role may be expanded to include behaviors that are protective of their wife such as *consistent* condom use. In addition, relationship dynamics may change and wives' roles may shift after their husbands are diagnosed with HIV: They may take more initiative in protecting themselves and strongly pursue condom use. Nevertheless, the extent to which gender roles shift *or* are maintained after a husband is diagnosed with HIV is not clear.

Unprotected and coercive sex perpetuated by HIV-infected husbands can facilitate transmission of HIV and other STIs to their wives (Silverman, Decker, Saggurti,

Balaiah, & Raj, 2008). Exposure to or fear of experiencing intimate partner violence (IPV) can deter women from negotiating safer sex or refusing sex altogether. IPV also is reported to be both a cause and consequence of extramarital sex in South Asia (Silverman, Decker, Kapur, Gupta, & Raj, 2007; Silverman, et al., 2008). Studies in India report that husbands who have extramarital relationships are significantly more likely to be physically and sexually abusive toward their wives (Silverman, et al., 2008). Moreover, studies in India have shown that married men engage in extramarital relations because of unfulfilled sexual desire in marriage (Schensul et al., 2006; Schensul, Verma, & Nastasi, 2004) while maintaining a double standard in their belief that extramarital relations are improper or immoral for wives (Go et al., 2003). Yet, it is unclear how HIV serodiscordant couples respond to unfulfilled sexual desire in their marriage.

In Chapter two, among a full sample of serodiscordant couples, we described the pathways and the processes that underlie safer sex, no sex, coercive sex, and unprotected sex; such as traditional gender norms, sex desire communication, fear of HIV, sex refusal, and the consequences of unfulfilled sexual desire among serodiscordant couples in Gujarat, India. In this chapter, themes similar to those presented in Chapter 2 are explored, however only one serodiscordant couple, exemplifying the most severe and complex case, is analyzed and discussed.

METHODS

Case Selection

From February 2010 to November 2010, 23 married, serodiscordant couples (23 HIV-negative wives and their 23 HIV-positive husbands, for a total of 46 individuals)

were recruited for in-depth interviews (IDIs). In this paper, we will describe just one of these 23 couples. To summarize, index partners who were identified as an being HIV-positive and in a HIV serodiscordant relationship were identified by site staff at the voluntary counseling and testing center (VCTC) and Network of Positive People in Surat, Gujarat (an NGO providing counseling, support, and advocacy services for HIV-positive people). Couples qualified for the study if the following eligibility criteria were met: 1) they consisted of an HIV-positive husband and an HIV-negative wife; 2) they were married for at least six months; 3) they had marital sex in the past six months; 4) they were recruited through the VCTC or network of positive people in Surat; and 5) both husband and wife were 18 years of age or older. Details of sample selection and study procedures are published elsewhere (Patel, et al., 2011).

The husband-wife pair selected for this case study was interviewed separately in accordance with the study protocol to ensure participant comfort and richness of responses. The husband-wife interviews were audio-recorded with permission and conducted in Hindi. The focus of the interview was to understand the relationship dynamics of a HIV serodiscordant couple and how living with HIV or living with a husband who has HIV, impacts marital sex and HIV risk.

The protocol was reviewed by both the Emory University Institutional Review Board and the Research Ethics Committee at the Government Medical College in Surat. The participants received a small meal and 150 rupees each to help cover lost wages and transportation costs attributed to participating in the study.

Data Preparation and Analysis

In Chapter 2, a grounded theory approach was used to analyze all of the interviews in the sample. Through this process, positive cases as well as outliers or negative cases were identified. From this, we identified one negative case (i.e. one couple) which presented several risk factors that were not reflected well in the conceptual model, presented in Chapter 2. Analyzing factors which fuel risk *within a couple* provides a level of understanding that cannot be captured when conducting analysis across couples (presented in Chapter 2). A clear understanding of how factors can amplify HIV risk is critical for HIV services providers. In this way, HIV service providers can address the unique needs of their clients. Specifically, this case study exemplified how shifts in gender roles after the husband was diagnosed with HIV, contributed to HIV risk including unprotected sex with extramarital partners, inconsistent condom use, and sexual violence.

RESULTS

Case Summary

Akbar and Naseem *(fictitious names were used to protect the identity of participants),* a Muslim couple in their 40s, had been married for 20 years and had five children. They were both illiterate, lived in the urban slums of Surat, and had a monthly family income of $80.00. Akbar was diagnosed with HIV after he developed tuberculosis and was tested for HIV. Akbar believed he acquired the infection through unprotected sex with extramarital partners. His wife, Naseem, came to know of his HIV status through his physicians.

Before learning about Akbar's diagnosis, Akbar and Naseem's relationship was rather tumultuous, and Akbar committed physical and sexual IPV regularly against Naseem. Akbar's mother-in-law, who lived with them, also committed physical violence against Naseem before Akbar's HIV diagnosis. However, after Akbar's diagnosis, he curbed his aggressive tendencies toward his wife and put an end to his mother's abusive ways. Naseem also took good care of Akbar after his illness, which fostered Akbar's appreciation of her.

Akbar did not work consistently before his diagnosis and worked much less afterwards due to his health and difficulty in finding work. Naseem was a day laborer and became the sole financial provider after Akbar's diagnosis: Her income was used to support Akbar, the couple's five children, and Akbar's parents. Additionally, because Naseem needed money to cover some of Akbar's medicine, she worked even longer hours to supplement her income. Despite her work, the family's basic needs were not met. Because of extreme financial need, Naseem began to engage in transactional sex with a distant uncle who lived in her village, who gave her money for sex and companionship. Akbar was aware that Naseem was supplementing her income in this way and was jealous, but he did not try to stop her as he knew she was contributing to the family's financial welfare. Naseem explained her situation in this way:

I kept [extra-marital] relations because I did not have any other alternative. I did not keep such relations because I was fond of it. There are 7 persons in the family. The son is also studying he is not going to work. I do not have any support. Neither my parents nor my in-laws support me. I needed someone's support. I did not go to anyone because I was fond of it. 'Now I give my dignity so he gives me some money.

Over time, Naseem's extramarital, transactional relationship with her distant uncle evolved into a supportive, loving relationship, providing her an escape from her worries at home. In fact, Naseem's extramarital partner had asked to marry her, but she was afraid that it would affect her children's marriage prospects and felt guilty about leaving her sick husband behind.

Akbar's HIV-positive status, his inability to perform sexually (i.e. ejaculate), and Naseem's extramarital relationship negatively affected Naseem's desire to have sex with Akbar. Naseem's lack of desire and refusal to have sex contributed to unfulfilled sexual desire on Akbar's part. As a result of Akbar's unfulfilled sexual desire, he occasionally forced Naseem to have sex and engaged in unprotected extramarital relations with other women and men.

Key Factors that Influence HIV Transmission Risk

Unprotected Sex with Extramarital Partners

Both Naseem and Akbar engaged in unprotected sexual relations with extramarital partners. Akbar explained that he was averse to using protection because condoms were displeasing. When asked about using condoms with his extramarital partners, he explained:

I: What would happen if the condom was not there in your hand?
P: If the condom was not there we would still have [sex] without it.
P: The men who were passing by and using the toilet or urinal…we would make gestures with each other and have [sex] with them, so we did not use a condom then.

Naseem's situation was different. She tried to negotiate safe sex with her distant uncle, but he was unwilling when she asked him to use condoms. Although this unwillingness concerned Naseem, she continued to engage in unprotected sex with him. Naseem explained:

P: I told him to use a condom. I said if I have any sickness or if you have any sickness then what will happen. He said I do not care if both of us die. 'You will get the sickness that I have or I will have the sickness that you have. He says that I have given you my heart so I do not have any tension even if I die, but I do not want to use a condom. '
I: Did you know the HIV status of the person with whom you had [sexual] relation?
P: I do not know about it.

Both Naseem and Akbar did not know the HIV status of their extramarital partner(s) when they engaged in unprotected sex with them. Naseem perceived having unprotected sex with her distant uncle as another route of HIV infection, because he also had other wives in other areas of India whom he visited on occasion. For Akbar, having unprotected sex with multiple casual male and female partners was a potential route of reinfection (with a more virulent or resistant strain of HIV) and another route for acquiring other STIs, which would potentially increase his chance of passing his infection on to Naseem when they had unprotected sex.

Condom Use

Although Naseem and Akbar had unprotected sex with extramarital partners, Naseem insisted that Akbar use condoms when they had sex. Even though Akbar did not enjoy sex with a condom, he occasionally acquiesced to Naseem's demands. Akbar shared how his wife insisted on condom use:

P: My wife forces me to use a condom. She says that if you do not use a condom I will come into trouble. So she does not let me have [sex] without using condoms.

P: When I wish for it and if the condom is not there she does not allow me to have [sex]. She refuses me. She tells me that I will not have [sex] without using a condom.

Naseem shared that at times Akbar refused condoms because he did not enjoy it, but she tried to make him understand:

P: I tell him that I will have [sex] if you use a condom. If the condom is there he has [sex] otherwise he sleeps peacefully.
I: What happens if he wishes [to have sex] without using condom?
P: I directly refuse him. He feels bad for some time and then after that I explain to him why, so he feels good. I tell him that the germs that are there in your body come into me and I will also become sick.

After Akbar's HIV diagnosis, it was an ongoing challenge for Naseem to get Akbar to use condoms and understand why condom use was important. Akbar often gave in to Naseem's demands because she took good care of him after his illness and he felt guilty because of his positive HIV status. However, condom use clearly was a source of tension in the relationship. In addition, even though Naseem and Akbar used condoms most of the time after HIV entered their lives, Akbar occasionally forced Naseem to have unprotected sex, even after her overt refusal.

Sex Refusal and IPV

For the most part, Akbar reduced his aggressive tendencies towards his wife and acquiesced to her wishes to use condoms; however, Akbar still became frustrated and violent on occasion when his wife refused sex. Even though Naseem asserted herself verbally and physically, she sometimes fell victim to unprotected sexual violence. Akbar explained his situation:

When she does not talk to me, how can we have [sexual] relations? When she goes to work she smiles at that person and does mischief 'masti' with him and

when I will come back home she will become angry. She will not talk to me. I sleep on the floor and she sleeps alone on the bed. She does not take the initiative [to have sex]. When I tell her she refuses to have [sex]… then I have [sex] with her forcefully sometimes. …She says I will not have [sex] with you. So after that we have [sex] forcefully.

Naseem described her own reaction as well as her husband's reaction when she refused sex:

I: What will you do if he has a wish to have [sex]?
P: When I refuse, he gets angry sometime and even slaps me. So I also get wild and in anger I do anything now [after HIV]. I throw anything on him and beat him.

Akbar's inability to respect his wife's refusal of sex and frustration about his wife's lack of sexual desire instigated sexual violence. Despite these occasional bouts of violence, Naseem was mostly able to assert and protect herself against unsafe sex with Akbar. Nevertheless, their violent disagreements highlight the ongoing challenges to safer sex that may surface in serodiscordant couples.

DISCUSSION & RECOMMENDATIONS

This case study highlighted the complexity in the relationship dynamics and behaviors between an HIV-positive husband and his HIV-negative wife. While the quality of the couple's marital relationship seemed to improve somewhat after the husband was diagnosed with HIV, the wife's adoption of customarily masculine provider and protector roles and her transgression of norms of femininity through transactional, survival sex challenged the couple's relationship, including their ability to engage in safer sex. Specifically, the wife became the primary financial provider because the husband was unable to find regular work due to his health. Because of the family's growing

needs, the wife began to engage in unprotected, transactional sex. The wife also began to refuse sex when her husband expressed desire. However, when the couple did have sex, the wife demanded condom use despite the husband's aversion to condoms. These factors collectively contributed to the husband's unfulfilled sexual desire which culminated in sexual and physical violence with his wife. Ultimately, the husband sought out other male and female sexual partners to fulfill his sexual desires.

As presented above, one risk factor can trigger other risk factors. Thus, all serodiscordant couples need to be asked and counseled about a range of risk behaviors. While this couple represents an "extreme" case, it illustrates the fact that marital dynamics and behaviors can change over time, thus ongoing risk assessments and tailored counseling of serodiscordant couples may be important. In addition, transgressions of gender roles, specifically a wife's assertiveness in the form of sex refusal, can also instigate IPV which contributes to HIV risk among HIV-negative wives. Addressing perceived loss of masculinity and changes in gender roles after a husband is diagnosed with HIV may be a key area for counseling intervention with serodiscordant couples. Also, in developing countries such as India, where poverty is a major public health issue, economic interventions for PLWHA, such as help with finding part-time, non-labor intensive work, as well as interventions that enable wives to have financial alternatives to transactional sex, should be considered. Moreover, lack of sexual desire and communication of sexual desire among married serodiscordant couples can contribute to unfulfilled sexual desire, and ultimately extramarital relations, which is a critical area to address in couples counseling interventions.

Counseling programs for HIV serodiscordant couples which promote safer sex and joint sexual decision-making on an ongoing and consistent basis are essential. Specifically, enhancing couples' communications about sex, including sexual desire and unfulfilled desire, may help promote a change in male-dominated sexual decision-making, thus promoting greater protections against HIV. Sex communication can be enhanced through a formal counseling program for serodiscordant couples. In addition, screening and counseling for IPV need to be included in a couples-based counseling program given the propensity for violence against women and the evidence regarding the intersection of IPV and HIV in the region. Where there are power imbalances in marital relationships, women have restricted options about when sex takes place and whether or not it is protected. Training in gender and women's rights geared toward couples may reduce the occurrence of sexual IPV in serodiscordant couples and thus should be considered. Lastly, providing specialized training to counselors in voluntary counseling and testing centers and NGOs to address IPV may help reduce the threat of violence against wives.

Although research has shown that consistent and correct condom use can help reduce the transmission of HIV to a HIV-negative partner, married couples face several challenges in enacting and maintaining condom use. Abstinence among HIV serodiscordant couples may not be an appropriate message, and monogamy does not provide a complete protection to an HIV-negative partner in such a relationship. Moreover, screening husbands and wives respectively for non-marital sexual partners and sexual risk behaviors with these partners may be important for tailoring messages to these clients. Using *both* a one-on-one counseling approach with gender-matched

counselors to discuss certain sensitive topics like extramarital partners and IPV, as well as a couples counseling approach to address interpersonal topics like sex communication, may be essential to prevent the spectrum of risk that may lie within serodiscordant couples. Programs that have utilized both approaches have been shown to be effective at reducing risk behaviors among serodiscordant couples in the United States and Africa (Allen et al., 2003; El-Bassel et al., 2010). Including client-centered, gender sensitization trainings for counselors may be important in developing counseling programs for serodiscordant couples.

CONCLUSIONS

Although only one HIV serodiscordant couple is presented in the study, it represents a range of risks that may surface in other couples where one partner is HIV-positive and the other is not. The case study highlights the need to assess for a range of risk behaviors during counseling. Early and ongoing counseling of HIV serodiscordant couples are critical. In this way, relationships with counselors can be developed and appropriate screening for risk behaviors, such as inconsistent condom use, IPV, and alcohol use can take place.

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CHAPTER #4

Individual, Interpersonal, and Behavioral factors that Influence Male-dominated Sexual Decision-Making and Inconsistent Condom Use among Married HIV Serodiscordant Couples in Gujarat, India

ABSTRACT

Introduction: Approximately 2.5 million people are infected with HIV in India, with over 40% of new infections occurring among married women. No studies have examined the factors that may contribute to HIV transmission among HIV-negative wives in HIV serodiscordant relationships in Gujarat, one of the states that accounts for the largest proportions of new HIV cases in India.

Methods: This cross-sectional survey study was conducted at two, large HIV service centers in Surat, Gujarat with 185 HIV serodiscordant, married couples (i.e. 185 HIV-positive husbands and their 185 HIV-negative wives). We explored the socio-demographic, individual, interpersonal, and behavioral characteristics of HIV-positive husbands and their HIV-negative wives. We also tested the association of these characteristics with inconsistent condom use and male-dominated sexual decision-making. We analyzed survey data using both univariate and multivariate logistic regression analyses.

Results: Risk to HIV-negative wives was apparent in both the univariate and multivariate analyses. Approximately 10% of couples reported inconsistent condom use in the past 3 months, 10% reported condom use errors, and 20% reported intimate partner violence (IPV). In addition, discrepant reports of sex communication among HIV-positive husbands (86%) and their HIV-negative wives (50%) were noted. Moreover, HIVnegative wives who reported sex communication were significantly less likely to

report inconsistent condom use (Adj OR=0.108) and male-dominated decision-making about condom use (Adj OR=0.405) with their HIV-positive husbands. Lastly, couples who reported IPV were significantly more likely to report inconsistent condom use (Adj OR=6.466).

Conclusions: Despite low reports of inconsistent condom use, HIV transmission risk exists for HIV-negative wives in serodiscordant relationships. Prevention interventions for married serodiscordant couples are needed to maintain safer sexual behaviors and address persistent or new challenges that disrupt correct and consistent condom use, such as lack of sex communication and IPV.

INTRODUCTION

India has the third largest number of HIV cases in the world with an estimated 2.5 million people infected (UNAIDS, 2007). Mounting evidence in India suggests that the greatest risk for HIV transmission among women lies within marital relationships (Godbole & Mehendale, 2005; Marlow, Tolley, Kohli, & Mehendale, 2010; Silverman, Decker, Saggurti, Balaiah, & Raj, 2008). Over 80% of new infections are believed to occur from heterosexual transmission (NACO, 2006) and according to a national study, approximately 40% of new infections occur among married women ages 15-49 years (Decker, et al, 2008). HIV-negative partners in stable, serodiscordant relationships are among the most vulnerable to acquiring HIV (Allen et al., 2003; Dunkle et al., 2008; El-Bassel et al., 2010; Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Murugavel, et al., 2010). However, few studies have explored the characteristics that influence HIV transmission risk to HIV-negative wives in serodiscordant relationships in India. Given that the majority of Indian adults aged 18 years or older are married, couple-level HIV prevention programs may be essential to reduce HIV infections. Focusing on both partners and couple dynamics may provide a better understanding of the interpersonal context in which sex transpires and potentially risky behaviors occur.

Most research on HIV serodiscordant couples in India is geographically focused in Tamil Nadu (Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Thamburaj, et al., 2010; Venkatesh et al., 2011) and Maharashtra states (Mehendale et al., 2006), where the HIV prevalence is high. Moreover, recent studies report only the behaviors and characteristics of the HIV-positive partner in a serodiscordant

relationship, and not the behaviors of both partners or the interpersonal dynamic (Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Thamburaj, et al., 2010; Venkatesh, et al., 2011). No studies have been conducted with HIV serodiscordant couples in Gujarat, the state which accounts for one of the largest proportions of new HIV cases in India (DNA, 2011; Press Trust of India, 2011).

In this study, the primary aims are to describe the individual, interpersonal, and behavioral factors that influence sexual decision-making power and inconsistent condom use among husbands and their wives in HIV serodiscordant relationships.

BACKGROUND

Interpersonal factors that influence power in sexual decision-making and condom use

Although correct and consistent condom use is the primary HIV prevention strategy, sexual-decision making power in married couples can provide important insights into the relationship dynamics which influence sex and condom use. *Sexual decision-making power* refers to the decisions, preferences, or resolutions that an individual makes regarding a condition, such as when to have sex or whether to use contraception, such as condoms (Varga, 1997). Many studies have shown that wives tend to have less power in sexual decision-making than husbands (Go et al., 2003; Joshi, Dhapola, Kurian, & Pelto, 2001; Santhya, Jejeebhoy, Jejeebhoy, Shah, & Thapa, 2005), even in serodiscordant couples. In a study of such couples in Uganda, unprotected, coercive sex was common. Women often expressed feelings of powerlessness in sexual decision-making, even in cases where women knew of their

partners' HIV status (Emusu et al., 2009). Unprotected and coercive sex perpetuated by HIV infected husbands can facilitate transmission of HIV and other STIs to their wives (Silverman, et al., 2008). In an analysis of the 2005-2006 Indian National Health and Family Survey (NFHS-3), high percentages of wives in Gujarat reported being physically abused (25%), emotionally abused (18%), and even sexually abused (7%) by their husbands in the prior year (IIPS & Macro, 2006)(IIPS & Macro, 2006)(IIPS & Macro, 2006). However, little research has been done in India on husbands' and wives' actual sexual-decision-making power and the correlates of these experiences among serodiscordant couples.

Several other interpersonal characteristics contribute to male-dominated sexual decision-making power and inconsistent condom use in heterosexual partnerships, including low levels of sexual communication among couples (Marlow, et al., 2010; McDougall, Edmeades, & Krishnan, 2011). For many Indian wives, sex is understood as something that is initiated by husbands (Lambert & Wood, 2005). Moreover, maintaining a women's virginity until marriage as well as passivity and ignorance during sex after marriage is highly valued in Indian society (Bhattacharya, 2004; Lambert & Wood, 2005). A study of sex communication among married couples in Bangalore reported that while husbands were more likely to express sexual desire, most wives refused sex from their spouse (McDougall, et al., 2011). However, little is known about the extent that sex communication influences sexual decision-making and condom use when one partner in the marriage has HIV and the other does not.

Other determinants of sexual decision-making power and condom use

Pregnancy desire among married serodiscordant couples can contribute to inconsistent condom use (Beyeza-Kashesya et al., 2009; Klein, Peña, Thornton, & Sauer, 2003). However, it is unclear whether or not some HIV-positive husbands and HIV-negative wives engage in strategies that protect the negative partner, such as *consistent* condom use, even when pregnancy desire surfaces. In addition, in India, it is common to live in an extended family (compared to a nuclear family); still, it is unclear whether household structure affects sexual decision-making between husbands and wives in these relationships.

Other individual-level factors, such as norms about sex, sexual dissatisfaction, low-levels of HIV-related knowledge (including proper condom use), length of time living with HIV, low perceived risk of HIV transmission/acquisition, and low condom use self-efficacy, may also influence sexual-decision-making power and inconsistent condom use. However, few quantitative studies have examined these relationships among married, HIV serodiscordant couples in India, and none have been conducted in Gujarat.

Although the predictors of the transmission of HIV to marital partners are well-studied (Decker et al., 2009; Ghosh, Wadhwa, & Kalipeni, 2009; Godbole & Mehendale, 2005), the determinants that underlie HIV risk among wives whose husbands are HIV-positive are not well understood in Gujarat or even in India at large. The purpose of this paper is to: 1) describe the socio-demographic, interpersonal, individual and behavioral characteristics of HIV-positive husbands and their HIV-

negative wives in serodiscordant relationships; and 2) determine the characteristics that influence sexual decision-making power and inconsistent condom use among husbands and their wives in serodiscordant relationships.

METHODS

The overall study of which this analysis is a part was a mixed-methods design using formative qualitative research and a subsequent quantitative survey among heterosexual, married couples where husbands were HIV-positive and their wives were HIV-negative. This paper focuses on the results of the quantitative survey; results from the qualitative research are reported elsewhere (Patel et al., 2011).

Study Site

This study was conducted in the city of Surat in Gujarat state, one of India's largest economic centers and the fourth fastest growing city in the world (Bhatt, 2011). The concomitant rise in the populations of intrastate and interstate migrants and commercial sex workers are believed to have contributed to the high HIV prevalence in Surat (Desai et al., 2003; DNA, 2011; Press Trust of India, 2011; Saggurti et al., 2011). Surat has the highest incidence of HIV in Gujarat (DNA, 2011) and also one of the largest networks for health and support of HIV-positive people (NSP+ and the largest voluntary counseling and testing center (VCTC) in the state. In the VCTC and NSP network, approximately 75% of married HIV discordant couples represent instances where the husband is HIV-positive and the wife is HIV-negative, thus giving this population research priority (Kosambiya, 2009).

Participant Recruitment

Survey participants were initially contacted about the study by VCTC or NSP+ staff either as part of a routine phone call or in person during a regular visit from May 2010 to October 2010. To avoid potential breach of confidentiality to HIV-negative wives, only *index partners* (i.e. the HIV-positive husbands in the serodiscordant couple) were contacted. Although some participants were told about the study over the phone, all initial screening by NSP+ and VCTC staff occurred in person. Initial screening criteria were: 1) that the couple had to speak Gujarati or Hindi; 2) that husband and wife were each at least 18 years of age; 3) that they were serodiscordant; and 4) that they be married for at least six months. If the HIV-positive husband said "yes" to each of these questions, he was prompted to ask his wife whether she would be interested in participating. If both were interested, the couple was referred to study staff for final screening. Final screening was conducted separately for husbands and wives in a private space by gender-matched research assistants (RAs). After verifying initial eligibility, husbands and wives were asked if they had had either protected or unprotected vaginal or anal sex with their marital partner in the past six months.

If both husband and wife met the eligibility criteria and were interested in the study, written consent was obtained in the participant's preferred language, either Gujarati or Hindi. Each participant received 175 rupees (about 4 US dollars) to help cover wage loss and transportation costs. This study was approved by the Ethics Committee at the Government Medical College, Surat and by the Emory University Institutional review Board.

Based on a pool of 375 married, serodiscordant couples (wife HIV-, husband HIV+), 350 index partners were approached with 45 screening ineligible because they had not had sex in the last six months. Among the eligible participants, a total of 114 elected not to participate, 28 simply declined, 28 had not disclosed their status to their wives, 24 did not have time, 22 had unavailable wives, and 12 had transportation issues. Of those approached, 191 couples agreed to participate and 185 actually completed surveys. Non-participants did not differ from participants with respect to age and length of time since HIV diagnosis

Development and Refinement of Survey Instrument

Qualitative findings, the socio-cultural context, and feedback from a community advisory board informed the development of the survey instrument for serodiscordant couples in Surat. Survey instruments for males and females were drafted in English and then translated into Hindi and Gujarati. Surveys were then piloted with 10 couples (20 participants; 10 in Gujarati and 10 in Hindi) to assess the adequacy of the translation, including terminology related to sexual health, and comprehension of the response options. Modifications included removing items to decrease respondent burden and simplifying language to facilitate translation and comprehension in local languages.

All VCTC and NSP+ staff received training in recruitment procedures and human research ethics prior to the study. Over the course of a six week period, study staff received separate training on HIV-related topics, survey development, survey administration, data entry, quality assurance, study procedures, and human research ethics. Due to literacy concerns, husband and wife surveys lasting approximately one

hour were administered in either Gujarat or Hindi by gender-matched staff in separate rooms to reduce bias in responses.

Study Measures

Covariates/Predictors

Socio-demographic Characteristics

Surveys administered to both members of the couple included socio-demographic questions such as age, highest educational level, income, mobile or migrant worker status, area of residence (i.e. village vs. town), religion, marriage type (arranged marriage vs. "love marriage" (i.e. when one selects their own marital partner)), and family type (i.e. living in an extended family vs. nuclear family) (Table 2).

HIV-Related Characteristics

Certain HIV-related characteristics such as counselor-recorded CD4 count, use of anti-retroviral therapy (ART), and number of years husband was living with HIV/AIDS, were asked only of HIV-positive husbands (Table 3). Both members of the couple also were asked about receipt of any couples counseling after they found out about their partner's HIV status (coded as either "some" (i.e. receipt of any couples counseling) or "none"). This "receipt of couples counseling" question was followed by either of two free response questions to husbands and wives: 1) if they received no couples counseling then, "What factors prevented you from getting counseling?" or 2)

if they received at least one couples counseling session, “Why did you go for counseling?”

Individual-level Characteristics

Pregnancy desire was assessed by asking each member of the couple about their desire to have any more children. In addition, husbands were asked a single question regarding potential risk of HIV transmission to their spouse and wives were asked a single question regarding potential risk of HIV acquisition from their spouse (Table 4).

The *Gender Equitable Men’s scale* (Pulerwitz, Gortmaker, & DeJong, 2000) was adapted for the Indian context, (Verma et al., 2006) using a five-item sexual relationship power subscale with three-point response options ranging from “do not agree” to “agree”. Higher scores indicated more male-dominated norms about sex. Cronbach’s alpha was .63 for both husbands and wives. A sample item was “It is the man who decides what type of sex to have.” An additional question to each member of the couple was asked: “Who *should* have more decision-making power in the relationship?” with three response options, “husband”, “wife”, or “both husband and wife” (Table 4).

One item rated on a four-point scale ranging from “not at all sexually satisfied” to “very sexually satisfied” assessed sexual satisfaction (i.e. penetrative or nonpenetrative sex) with marital partner in the past 3 months. Sexually dissatisfied was defined as those who reported “not at all sexually satisfied” (Table 3).

Condom negotiation self-efficacy was assessed by using a modified five-item instrument with a three-point response scale ("definitely no" to "definitely yes") that had been developed by DiClemente and Wingood (1995). A sample item was "Can you insist on condom use if your study partner does not want to use a condom?" (Table 4). Higher scores indicated higher condom negotiation self-efficacy and alphas were .62 for husbands and .70 for wives.

HIV risk-reduction knowledge was assessed using a nine-item scale with three response options: "true", "false", and "don't know". This scale was adapted (El-Bassel, et al., 2010) by replacing knowledge of viral load that did not reflect the local standard of care with context-specific items such as knowledge of CD4 count. Responses were summed and all "don't know" responses were categorized as incorrect responses. Alphas were .46 and .76, for husbands and wives, respectively). Condom use errors and use of alcohol in the prior 3 months was also assessed.

Interpersonal-level Characteristics

Sexual communication in the past 3 months was assessed by asking both members of the couple whether they discussed using condoms, how to make sex more fun, mutual masturbation, or oral sex. If participants indicated that they had communicated with their marital partner on *any* of the four topics, they were coded as "yes" for having engaged in sex communication (Table 4).

Intimate Partner Violence (IPV) was assessed by using six items from the Revised Conflict Tactics Scale (Straus & Douglas, 2004) on whether women had ever or in the prior year experienced physical, sexual, or emotional violence. A dichotomous (yes/no)

IPV variable was created to indicate whether women had experienced either physical, sexual, or emotional violence in the past year. Questions were not asked of husbands due to the possibility that it could instigate violence for wives after the survey (Table 4).

Main Outcomes: Male-dominated Sexual Decision-Making & Inconsistent Condom Use

Sexual decision-making was assessed by asking two questions: "Who primarily makes decisions about when to have sex?" and "Who primarily makes decisions about whether to use a condom or not?" The three response options were "you", "both you and your marital partner", and "your marital partner". Male-dominated decision-making was determined by whether the husband primarily made the decisions. The same coding procedures were used for male-dominated decision-making power regarding condom use (Table 5).

Consistent condom use was defined as condom use during 100% of anal and vaginal sexual intercourse occasions; less than 100% of the time was defined as inconsistent condom use (Table 5). A 90 day period was used to allow more time to capture sexual risk due to the fact that some couples may not have had any sex in the past 30 days. Due to the length of the recall period, the research assistants asked about sex acts for each month for the past three months, and tallied respective sex acts (Wingood et al., 2004).

Statistical Analyses

Descriptive statistics were performed on all variables (outcomes, predictors, all potential covariates) to assess their completeness and distributions. For refined or new survey items, psychometric properties were assessed using internal consistency estimates of reliability. Bivariate associations using correlations and chi-square tests were performed among all study variables to identify their potential for prediction of outcome variables and to identify potential multicollinearity among predictor variables (Kleinbaum, Kupper, Muller, & Nizam, 1998). Predictors that did not meet the screening significance criteria of $p \leq .20$ or were found to be significantly correlated were excluded from the model. If predictors were significantly correlated, a variance inflation factor >10 was used to determine multicollinearity. The only set of collinear items was time since marriage and husband's time since HIV diagnosis. We chose to retain time since HIV diagnosis as it was more relevant to serodiscordant couples. To assess differences between husbands' and wives' responses, paired t-tests for continuous variables and McNemar's tests for dichotomous and categorical variables were performed (Tables 3 & 4). All data analyses were conducted using SPSS 18 ® statistical package.

Multivariate Models

In separate models for HIV-positive husbands (N=185) and their HI- negative wives (N=185), logistic regression analysis was used to investigate predictors of two male-dominated decision-making variables: 1) male-dominated sexual decision-making and 2) male-dominated decision-making about condom use. First, bivariate analyses were conducted with all of the variables listed in Tables 2-4 for each of the two decision-

making outcomes for husbands and wives and those meeting the screening p-value were entered into the four logistic regression models. (Table 5).

We also conducted a sub-analysis with husbands (n=158) and wives (N=158) who reported any anal or vaginal sexual behavior with their spouse in the past 3 months. We examined inconsistent condom use with marital partner as the outcome variable and ran separate models for husbands and their wives. We conducted bivariate analyses (correlations and chi-square analyses) with inconsistent condom use as the outcome for husbands and wives, respectively, and those predictors meeting the screening p value were entered into separate logistic regression models. (Table 6).

RESULTS

Characteristics of Husbands and Wives

Descriptive statistics for the socio-demographic, interpersonal, individual, and behavioral characteristics of the study are presented in Tables 2-4. In general, husbands were six years older than wives (40 vs. 34 years of age) with an age range of 24-65 years for husbands and 19-58 years for wives. Most had arranged marriages and were married on average for about six years (ranged from 6 months -15 years). About 34% of couples reported living in joint or extended families. Less than 50% of husbands and their wives, respectively, were originally from Gujarat. Most couples lived in a city or town and had an average of two children; only 7% of couples had no children (Table 2).

Regarding HIV-related characteristics, about 88% of husbands were on ART and 50% of husbands had been diagnosed with HIV in the past two years with a mean time of

approximately three years since diagnosis. In addition, almost 50% of husbands and wives reported receiving one or no counseling sessions as a couple since the HIV diagnosis (Table 3). Moreover, when asked why wives had not come for counseling, about 50% of wives reported that they "were not asked to come," 20% stated "husband or in-laws said there was no need to come", 18% of wives said that they "don't need to come, as they know everything they need to know," and 12% mentioned "children prevented them from coming for counseling" or "work prevented them from going".

Individual-level factors like perceived transmission risk and condom self-efficacy were very similar for husbands and wives, with condom negotiation self-efficacy being slightly higher for wives ($p \leq .001$). Less than 10% of husbands and wives reported pregnancy desire. In addition, wives had much lower mean levels of HIV risk reduction-related knowledge than did husbands with a statistically significant difference ($p < .001$) between husbands' and wives' scores (Table 4).

Sex communication, an interpersonal characteristic, was significantly higher among husbands compared to wives ($p \leq .001$) (Table 4). In addition, 20% of wives reported having experienced intimate partner violence by their marital partner in the past year (Table 3). With regard to male-dominated decision-making power, 26.6% of husbands reported that they made decisions about when to have sex versus 34.1 % of wives who reported that their husbands dominated decisions regarding sex (Table 4). However, when asked who *should* have more decision-making power in the relationship, roughly half of husbands and wives reported that wives should have more decision-making power (Table 4). Moreover, 48.9% of husbands reported male-dominated

decision-making about condom use compared to only 33.7% of women who reported the same ($p \leq .01$) (Table 5).

Approximately 90% of wives and 92% of husbands engaged in *consistent condom use* in the past three months *(*Table 5). However, after examining the responses of husbands and their wives, the vast majority reported differently regarding the number of sex acts in the past three months with wives reporting fewer sex acts overall.

The overall model for male sexual decision-making of husbands was statistically significant for husbands and wives, respectively (Table 6). HIV-positive husbands who reported living in an extended family were less likely to report male-dominated decision-making about sex compared to those who were not living in an extended family. HIV-negative wives, who reported IPV, were more than twice as likely to report male-dominated sexual decision-making compared to those who did not report IPV (Table 6). In addition, the overall models for male-dominated decision-making regarding condom use for husbands and wives were statistically significant. HIV-positive husbands who received some couples counseling vs. no couples counseling, were less likely to report male-dominated decision-making regarding condom use (Table 6). Moreover, their HIV-negative wives who reported any sex communication were less likely to report male-dominated decision-making regarding condom use compared to wives who did not report any sex communication.

Multivariate Analyses: Inconsistent Condom Use

The overall models for inconsistent condom use were statistically significant for both husbands and wives (Table 7). Husbands who were diagnosed with HIV for a longer

time were less likely to report inconsistent condom use compared to those who were diagnosed more recently. Moreover, husbands who had more HIV risk-reduction knowledge were less likely to report inconsistent condom use compared to those who had less knowledge. In addition, husbands whose wives' reported IPV were six times as likely to report inconsistent condom use compared to wives who did not report IPV. Among their HIV-negative wives, those who reported any sex communication were less likely to report inconsistent condom use compared to those who did not report any sex communication.

DISCUSSION

Main Findings

HIV prevention studies in India, including those on serodiscordant couples, have typically been conducted in states in South India. No studies on serodiscordant couples have been conducted in Gujarat, one of the states with the highest proportion of new cases of HIV in India (Press Trust of India, 2011). The city of Surat, in particular, has the highest incidence of HIV in Gujarat (DNA, 2011). Surat's rapid and sustained economic growth has given rise to the unique HIV transmission dynamics which have contributed to the region's increase in HIV cases. Understanding the determinants that give rise to HIV in each region in India is crucial, given India's tremendous economic and socio-cultural diversity. While commonalities across India's regions do exist, the applicability of research findings to various regions of India is uncertain without context-specific studies. To our knowledge, this is one of the first studies to examine characteristics that

fuel risk among *both* HIV- positive husbands and their HIV-negative wives in serodiscordant relationships in Gujarat or in all of India.

Individual, interpersonal, and behavioral HIV-related factors perpetrated by husbands were prevalent in this study and exacerbated their wives' HIV risk. Specifically, husbands tended to be the sole recipients of HIV counseling; nearly 50% of wives did not receive counseling. Among HIV-negative wives, several modifiable barriers for couples counseling were uncovered, including "not being asked to come to the VCTC by husbands or in-laws" or "not called to come in by the service providers for counseling." Regarding individual-level characteristics, while husbands were more knowledgeable about HIV risk-reduction than their wives, 11% of husbands reported condom errors. In addition, compared with studies elsewhere, a relatively low number of husbands and wives reported a desire to have children (Beyeza-Kashesya, et al., 2009; Grabbe et al., 2009; Venkatesh, et al., 2011). With reference to interpersonal characteristics, a greater proportion of men (85.9%) reported communicating about sex with their wives and a significantly lower proportion (49.7%) of wives reported communicating about sex with their husbands, indicating a differential understanding between husbands and wives about what constituted sex communication. Moreover, HIV-negative wives who reported any sex communication were less likely to report male-dominated decision-making regarding condom use and less likely to report inconsistent condom use, indicating that sex communication can support safer sex strategies. Also, 20% of wives reported IPV by their husbands in the past year. This discrepancy in power

conferred by the husband upon his wife can significantly increase her vulnerability for HIV.

In addition, although husbands reported more male-dominated sexual decision-making regarding condom use compared to their wives, a large proportion of husbands and wives reported joint decision-making power about sex. The high proportion of joint decision-making regarding sex and condom use were not surprising given that the couples in this study were recruited from sites where HIV services were provided. In essence, couples may have already undergone some changes in attitudes and behaviors due to the services they received from the recruitment sites, and this fact may account for the higher rate of joint decision-making in the study sample.

With regards to behavioral characteristics, over 90% of husbands and wives reported consistent condom use in the past three months. However, when reviewing husbands' and wives' responses, the vast majority of husband and wives reported different numbers of vaginal sex acts (i.e. the main sex act reported), which may indicate social desirability bias. Some studies of serodiscordant couples in India have shown much higher proportions of inconsistent condom use among HIV-infected partners in serodiscordant relationships (Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Thamburaj, et al., 2010; Venkatesh, et al., 2011); however that result may be due to participants being surveyed before receiving HIV counseling. In this study, couples had received varying amounts of counseling. This finding is likely to reflect the reality of what is occurring in the VCTC and HIV-service centers with respect to the provision of counseling for couples. Based on the association noted

between male-dominated decision-making and receipt of counseling, it may be useful to place more focus on consistently providing couples-based counseling. More studies of serodiscordance that include data from both partners are needed to guide couple-level prevention efforts.

While a formal Couples Volunteer Testing and Counseling (CVTC) is not currently a part of the national or statewide HIV prevention plan, several studies have underscored the importance of incorporating *formal* couples counseling programs into the VCTC (Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Thamburaj, et al., 2010; Venkatesh, et al., 2011). Moreover, based on the cultural and social context in India, prevention among HIV serodiscordant couples may require a multi-pronged prevention approach. First, though the HIV-negative partner is encouraged to get tested and counseled, there is an overall emphasis for treatment of HIV-infected persons, particularly since ART services have been integrated into care at the government level. Wives are often the main caretaker of husbands, especially after their HIV diagnosis, and involving wives in HIV-related services such as regular HIV testing and counseling may be critical to bridge the service gap for HIV-negative wives in serodiscordant relationships. In addition, attending the VCTC for regular testing and counseling may not be in the wives' control; therefore, strategies that encourage husbands to bring their wives for counseling are critical. Second, given the traditional gender norms surrounding sex communication in India, emphasis needs to be placed on relationship dynamics such as enhancing couples' communication about sex. Doing so may help promote a change in male-dominated sexual decision-making, thereby promoting greater protection against HIV. For example, a small pilot study of a behavioral

intervention for serodiscordant husbands and wives covered topics like communication, problem-solving and negotiations skills, and found an increase in condom use and use of other prevention skills in these relationships during the three month follow-up. That study highlighted the importance of how sex communication can be enhanced through a formal counseling program for HIV serodiscordant couples. Third, with the husband's and wife's permission, including members of the extended family in counseling may be helpful and provide support to the couple, especially if they are living in an extended family household structure. Fourth, screening and counseling for IPV need to be included in a couple-based counseling program given the high propensity for violence against women and the evidence regarding the intersection of IPV and HIV in the region. Where there are power imbalances in marital relationships, women have restricted options about when sex takes place and whether or not it is protected. Specifically, providing specialized training to counselors in VCT and NGOs to address IPV may help reduce the threat of violence against wives.

Study Strengths and Limitations

The study has a number of strengths, including that it is the first study on serodiscordant couples in the state of Gujarat, which accounts for a growing number of HIV cases in India. This also study focuses on risk to married women which is a topic of high global health significance. In addition, it is one of the first studies in India to focus on both husbands and wives, and the specifically interpersonal factors that influence HIV transmission risk in serodiscordant relationships. However, we also recognize limitations related to the design and implementation of a study for serodiscordant couples. First, the cross-sectional study design precluded the testing of

formal explanatory models. Second, many scales had not been tested or validated in Hindi or Gujarati; however, community advisory board members assisted in the development of all scales which were pilot tested before administering the final surveys. Third, survey responses were self-reported and dependent upon the respondent's ability to recall information (e.g. condom use in the past 90 days) that may have resulted in either under-or over-reported responses. Fourth, results may not be generalizable to serodiscordant couples not residing in Gujarat or in India. In addition, due to the high sensitivity of the research topic and specificity of the population it was difficult to recruit high rates of participants. However, we were able to enroll over 50% of potential participants, demonstrating the feasibility of a study of this nature. Lastly, we examined only couples where wives were HIV-negative and husbands were HIV-positive so results cannot be applied to all serodiscordant couples. However, given the very high proportion of couples in the region where wives were HIV-negative and husbands are HIV-positive, this was a research priority. Despite these limitations, the study findings are useful in informing the development and refinement of counseling interventions for HIV serodiscordant couples, specifically in Surat and more broadly in Gujarat.

CONCLUSIONS

While a high proportion of husbands and wives reported consistent condom use, factors such as IPV, low sex communication among couples, and male-dominated sexual decision-making, create challenges in maintaining condom use for husbands and their wives. In addition, behaviors can change over time; thus, couples' counseling programs

for HIV serodiscordant couples that promote safer sex and sexual decision-making on an ongoing and consistent basis are crucial. While ours is an exploratory study, additional studies on dyadic-level models that investigate the interpersonal dynamics contributing to HIV risk are needed. Furthermore, future studies must also include biomedical aspects that are relevant to prevention among serodiscordant couples in India, including ART adherence, as this can affect transmissibility to the HIV-negative partner. Finally, studies of the efficacy of female-controlled prevention methods, such as microbicides and pre-exposure prophylaxis (PrEP) are needed.

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Table 2. Socio-demographic characteristics of HIV-positive husbands and HIV-negative wives in HIV serodiscordant relationships in Gujarat, India, 2010

Socio-demographic Characteristics	**Husbands** N=185 N (%)[1] Mean; SD[2]	**Wives** N=185 N (%)[1] Mean; SD[2]
Age (years)	39.8; 8.02	33.6; 8.27
Highest level of education		
No formal schooling	14 (8.1)	25 (13.5)
1-7	68 (36.8)	62 (33.5)
8-10	69 (37.3)	66 (35.7)
11-12	23 (12.5)	24 (13.0)
High School Graduate	11 (5.9)	8 (4.3)
Employment status		
Regular full-time work	14 (7.6)	1 (.5)
Full-time homemaker	-----	95 (51.4)
Self-employed	33 (17.9)	----
Part-time/Seasonal/Daily wage earner	114 (61.6)	88 (47.6)
Unemployed	24 (13.0)	----
Monthly income (rupees)		
Less than 3,000	52 (28.1)	40 (21.6)
3,000 - 7499	106 (57.3)	108 (58.3)
Over 7500	27 (14.6)	34(18.3)
Residence		
City/town	158 (85.4)	144 (77.8)
Village	27 (14.6)	41 (22.2)
Religion		
Hindu	169 (91.8)	159 (89.8)
Muslim	9 (4.9)	9 (5.1)
Other	7 (3.3)	17 (5.1)
Time since married (years)	6.03, 3.03	6.02; 2.98
Marriage Type		
Arranged	168 (90.8)	170 (92.4)
Love/Self-Selected	17 (9.2)	14 (7.6)
Children		
Average number of children	2.00; 1.13	2.00; 1.11
No Children	14 (7.6)	14 (7.6)
Living in extended family (yes/no)	63 (34.1)	63 (34.1)

[1] Pertains to dichotomous or categorical variables
[2] Pertains only to means and standard deviations of continuous variables

Table 3. HIV-Related characteristics among HIV-positive husbands and HIV-negative wives in HIV serodiscordant relationships in Gujarat, India, 2010

HIV-Related Characteristics	**Husbands** N=185 N (%)[1] Mean; SD[2]	**Wives** N=185 N (%)[1] Mean; SD[2]	**Difference** Between Husbands' and Wives' Responses (p-value)
Duration of diagnosis (years)			
	36 (19.5)		
Less than 1 year	55 (29.7)	----	
1 to 2 years ago	48 (25.9)	----	
3 to 4 years ago	47 (24.8)	----	
5 years and over			
	3.28, 2.84	----	----
CD4 cell count/mm^3	379.14; 210.61	----	----
Currently on antiretroviral therapy	162 (87.57)	----	----
Number of times received counseling as a couple since diagnosed with HIV:			
Never	39 (21.1)	21 (17.9)	
1	54 (29.2)	30 (25.6)	
2-3	69 (37.3)	50 (42.7)	
4 or more	23 (12.4)	16 (13.7)	<.001

[1] Pertains to dichotomous or categorical variables
[2] Pertains only to means and standard deviations of continuous variables

Table 4. Individual and interpersonal characteristics of HIV-positive husbands and HIV-negative wives in serodiscordant relationships in Gujarat, India, 2010

Characteristics	Husbands N=185 N (%)[1] Mean; SD[2]	Wives N=185 N (%)[1] Mean; SD[2]	Difference Between Husbands' and Wives' Responses (p-value)
Individual-level			
Desire to have children/more children? (yes)	16 (8.6)	11 (6.0)	----
Perceived risk of transmitting/acquiring HIV	31 (16.8)	31 (16.8)	----
Sexual relationship power	12.64; 2.91	13.58; 3.10	.041
Perception of who *should* have more decision-making power in your relationship?			
Perceive Husbands	84 (45.7)	69 (37.9)	
Perceive Wives	93 (50.5)	101 (55.5)	
Perceive Both	7 (3.8)	12 (6.5)	----
Sexually Satisfied (yes)	182 (98.9)	172 (94.5)	.021
Condom Negotiation Self-Efficacy	11.62; 2.42	13.19; 1.66	<.001
HIV risk-reduction knowledge	6.38; 1.57	3.41;1.80	<.001
Condom use errors:			
-More than one condom used during sex	20 (11.0)	17 (9.2)	
-Condom slips/tears	11 (7.0)	9 (6.1)	----
Did you use alcohol in past 3 months (yes/no)?	46 (24.9)	1 (.51)	----
Interpersonal-level			
Any Sex communication[3] (yes)	158 (85.9)	91(49.7)	<.001
Experienced physical abuse, verbal abuse or sexual abuse in past 1 year	----	19.7	----

[1] Pertains to dichotomous or categorical variables
[2] Pertains only to means and standard deviations of continuous variables

Table 5. Main Outcomes: Sexual decision-making power and Inconsistent condom use among HIV-positive husbands and HIV-negative wives in serodiscordant relationships in Gujarat, India, 2010

Main Outcomes	**Husbands** N=158 N (%)	**Wives** N=158 N (%)	**Difference** Between Husbands' and Wives' Responses (p-value)
Who has decision-making power about sex?			
Husbands	49 (26.6)	63 (34.1)	
Both	131 (71.2)	106 (57.3)	
Wives	4 (2.2)	16 (8.6)	----
Who has decision-making power about condom use?			
Husbands	90 (48.9)	61 (33.7)	
Both	79 (42.9)	94 (50.9)	
Wives	15 (8.2)	26 (14.4)	.002
Inconsistent Condoms in past 3 months with marital partner[2]	13 (8.2)	15 (9.5)	----

[1] Based on behavior in the past six months

[2] "Inconsistent condom use" is based on how many reported in sex in the past 3 months

Table 6. Results from a multivariate logistic regression analysis: Characteristics associated with male-dominated sexual decision-making among husbands and wives in HIV serodiscordant relationships, Gujarat, India, 2010

VARIABLES[a] **(Referent)**	**HIV+ HUSBANDS (N=185)** **Male-Dominated Decision Making about Sex**	**HIV+ HUSBANDS (N=185)** **Male-Dominated Decision Making about Condom Use**	**HIV- WIVES (N=185)** **Male-Dominated Decision Making about Sex**	**HIV- WIVES (N=185)** **Male-Dominated Decision Making about Condom Use**
	Adjusted OR (95% CI)	*Adjusted OR (95% CI)*	*Adjusted OR (95% CI)*	*Adjusted OR (95% CI)*
Time since Husband's HIV diagnosis[1]	0.88 (0.77, 1.02)	1.07 (0.95, 1.19	1.02 (0.91, 1.14)	1.10 (0.98-1.23)
Living in Joint/Extended Family (Yes vs. No)	0.34* (0.14, 0.80)	0.56 (0.27, 1.12)	---	0.75 0.36, 1.55
HIV risk-reduction knowledge	----	1.12 (0.90, 1.38)	----	----
Receipt of Couples' Counseling (Some vs. None)	----	0.40* (0.18, 0.88)	----	----
Sexual relationship power	1.06 (0.94, 1.20)	1.04 (0.93, 1.16)	1.10 (1.00, 1.22)	1.07 (0.96, 1.20)
Any Sexual Communication (Yes vs. No)	0.60 (0.22,1.60)	----	0.53 (0.28, 1.01)	0.41** (0.20-0.80)
Perceived Risk of Acquiring/Transmitting HIV (Yes vs. No)	----	1.72 (0.74, 3.97)	----	----
Wives History of IPV (Yes vs. No)	----	-----	2.42* (1.10, 5.30)	----

[1] Indicates a continuous measure, thus no referent is indicated

[a]For each of the outcome variables and all of the independent variables, bivariate analyses using chi-squares for dichotomous variables, and Pearson's & Spearman's correlations for continuous variables were conducted.

----Did not meet screening alpha of p≤.20, thus were not entered in each of the respective logistic regression models for husbands and wives.

* p ≤.05

** p ≤.01;

Table 7. Results from a multivariate logistic regression analysis: Characteristics associated with separate reports of inconsistent condom use by husbands and their wives in 158 HIV serodiscordant relationships, Gujarat, India, 2010

Variables[a] **(Referents)**	**HIV+ HUSBANDS (N=158)** **Reports of Inconsistent Condom Use**	**HIV- WIVES (N=158)** **Reports of Inconsistent Condom Use**
	Adjusted OR (95% CI)	*Adjusted OR (95% CI)*
Time since husband's HIV diagnosis[1]	0.46* (0.23, 0.92)	0.28** (0.094, 0.65)
HIV risk-reduction knowledge[1]	0.55* (0.32, 0.94)	0.79 (0.478, 1.32)
Counseling (Some vs. None)	----	0.301 (.056, 1.62)
Any sexual communication (Yes vs. No)	0.17 (0.02, 1.48)	0.11* (0.02,0.76)
Sexual dissatisfied (Yes vs. No)	---	5.39 (0.43, 67.21)
Perceived risk of acquiring/transmitting HIV (Yes vs. No)	5.64 (0.89, 35.7)	0.83 (0.12, 5.94)
Wife's history of IPV (Yes vs. No)	6.47* (1.21, 34.71)	---
Condom negotiation self-efficacy[1]	0.85 (0.55,1.34)	---

[1] Indicates a continuous measure, thus no referent is indicated

[a] For each of the outcome variables and all of the independent variables, bivariate analyses using chi-squares for dichotomous variable, Pearson's & Spearman's correlations for continuous variables were conducted. Variables were screened for inclusion in the multivariate models.

---- Did not meet screening alpha of p≤ 0.20, thus were not entered in each of the respective logistic regression models for husbands and wives.

* p ≤.05

** p ≤.01;

CHAPTER #5:

Summary & Conclusions

India has the third largest number of HIV cases on the world, with an estimated 2.5 million people infected (UNAIDS, 2007). HIV-negative partners in stable, serodiscordant relationships are among the most vulnerable to acquiring HIV (Allen et al., 2003; Dunkle et al., 2008; El-Bassel et al., 2010; Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Murugavel, et al., 2010). However, very few studies have explored the characteristics that underlie HIV transmission risk to HIV-negative wives in serodiscordant relationships in India. No studies on married, serodiscordant couples have been conducted in Gujarat, one of the states with the highest proportion of new cases of HIV in India (Press Trust of India, 2011). The city of Surat, in particular, has the highest incidence of HIV in Gujarat (DNA, 2011). Understanding the determinants that give rise to HIV in each region of India is crucial, given India's tremendous economic and socio-cultural diversity. While commonalities across India's regions do exist, the applicability of research findings to various regions of India is uncertain without context-specific studies. This is the first study to examine characteristics that protect against HIV and fuel risk among HIV- positive husbands and their HIV-negative wives in serodiscordant relationships in Gujarat, and is among the first studies of its kind in India.

Although research has shown that consistent and correct condom use can help reduce the transmission of HIV to a HIV-negative partner, married couples face several challenges in enacting and maintaining such condom use. Abstinence among married, serodiscordant couples may not be an appropriate message, and monogamy does not

provide a complete protection to an HIV-negative partner in such a relationship. Given that these couples may encounter challenges early or across the life course, ongoing interventions are critical to prevent transmission of HIV to the HIV-negative partner. Thus, both primary and secondary interventions are needed to prevent transmission in couples.

A formal Couples Volunteer Testing and Counseling (CVTC) is not currently a part of the national or statewide HIV prevention plan in India. Although several studies have underscored the importance of incorporating *formal* couples counseling programs into the VCTC (Kumarasamy, Venkatesh, Srikrishnan, Prasad, Balakrishnan, Thamburaj, et al., 2010; Venkatesh et al., 2011), such a program has not been developed. Moreover, based on study findings and the cultural and social context in India, prevention among HIV serodiscordant couples may require a multi-pronged prevention approach. This study elucidated several areas to potentially intervene with couples where wives were HIV-negative and husbands were HIV-positive.

Chapter two focused on the qualitative findings and described a new conceptual framework that explained the factors which both protect HIV-negative wives against and put them at risk for HIV. Overall, the majority of couples engaged in consistent condom use regardless of their number of children, their marital duration, or time since the husband's diagnosis with HIV. The results identified five main pathways through which gender norms both protected against and placed wives at risk for HIV; however, there was variation and complexity within the pathways that influenced risk among husbands and wives. The factors that protected wives against HIV were fear of contracting HIV,

mutual respect regarding sex, positive sex communication, a wife's desire to protect herself, and a husband's desire to protect his HIV-negative wife. This study also revealed several factors which contributed to pathways leading to the four respective outcomes of safer sex, no sex, coercive sex, and unprotected sex. These pathways had not been described previously among HIV serodiscordant couples in India. While the pathways leading to safer sex and not having sex were the most common, both behaviors contributed to unfulfilled sexual desire which, at times, led to extramarital relations and corresponding HIV risk to both marital and non-marital partners. While most husbands sought extramarital partners as a sexual outlet for unfulfilled desire, some of these husbands considered extramarital affairs to be a method for protecting their wives against HIV. Lastly, a wife's refusal and avoidance of sex contributed to coercive sex which increased her HIV risk. The study also revealed that, while some HIV-positive husbands and HIV-negative wives assumed traditional gender norms or stated that they subscribed to these norms, many deviated from them for various reasons. Among some couples, wives' passivity regarding sex and indirect references to sex were replaced by non-traditional behaviors, such as assertiveness about sex refusal and verbal demands to use condoms, which promoted protection against HIV

Chapter three explicated one HIV serodiscordant couple who represented a range of risks that could surface in other serodiscordant couples and highlighted the need to assess for certain risk behaviors during counseling. The quality of the marital relationship seemed to improve somewhat after the husband was diagnosed with HIV. Additionally, the wife's adoption of customarily masculine provider and protector roles and her transgression of norms of femininity through transactional (survival) sex challenged the

couple's relationship, including their ability to engage in safer sex. Specifically, the wife became the primary financial provider because the husband was unable to find regular work due to his health. Because of the family's growing needs, the wife began to engage in unprotected, transactional sex; she also began to refuse sex when her husband expressed desire. However, when the couple did have sex, the wife demanded condom use despite the husband's aversion to condoms. These factors collectively contributed to the husband's unfulfilled sexual desire which culminated in sexual and physical violence with his wife. Ultimately, due to unfulfilled sexual desire, the husband sought out other male and female sexual partners. These shifts in roles and behaviors after HIV impacted the couples' relationship and exacerbated HIV risk.

Building upon the findings from the qualitative work, chapter four quantitatively described the socio-demographic, individual, interpersonal, and behavioral characteristics among serodiscordant couples. This chapter also explored whether these characteristics were associated with male-dominated sexual decision-making and inconsistent condom use. While a high proportion of husbands and wives reported consistent condom use, factors such as IPV, low sex communication among couples, and male-dominated sexual decision-making, created challenges in maintaining condom use for husbands and their wives. In addition, behaviors can change over time; therefore, couples counseling programs for HIV serodiscordant couples that promote safer sex and sexual decision-making on an ongoing and consistent basis are crucial.

The findings from this study suggest a need for an ongoing counseling and risk screening for both the HIV-positive and the HIV- negative partner in serodiscordant relationships. First, though the HIV-negative partner is encouraged to get tested and

counseled, there should be an overall emphasis for treatment of HIV-infected persons, particularly since ART services have been integrated into care at the government level. Wives are often the main caretaker of husbands, especially after their HIV diagnosis, and involving wives in HIV-related services, such as regular HIV testing and counseling, may be critical to bridge the service gap for HIV-negative wives in serodiscordant relationships. In addition, attending the VCTC for regular testing and counseling is not entirely in the wives' control; therefore, strategies that encourage husbands to bring their wives for counseling are critical. Second, given the traditional gender norms surrounding sex communication in India, emphasis needs to be placed on relationship dynamics, such as enhancing couples' communication about sex on topics like sexual desire and unfulfilled desire. Third, with the husband's and wife's permission, including members of the extended family in counseling may be helpful to the couple, especially if they are living in such an extended family household structure. Fourth, screening and counseling for IPV need to be included in a couple-based counseling program given the high proportion of violence against women and the evidence regarding the intersection of IPV and HIV in the region. Where there are power imbalances in marital relationships, women have restricted options about when sex takes place and whether it is protected. Specifically, providing specialized training to HIV prevention counselors may help reduce the threat of violence against wives. Fifth, economic interventions with HIV-negative wives in serodiscordant couples might enable such wives to have financial alternatives to transactional sex. Sixth, understanding that the roles and responsibilities of husbands and wives may change as a result of one partner being diagnosed with HIV may be important to address in order to minimize conflict in marriage. For example,

helping HIV-positive men navigate the perceived loss of masculinity when they are diagnosed with HIV, such as the transfer of their provider and protector roles to their wives, may help prevent problems in marriage and improve relationship dynamics. In addition couples training in gender rights in an effort to reduce the occurrence of sexual IPV in serodiscordant couples may be an intervention worth considering. Lastly, providing specialized training to counselors in voluntary counseling and testing centers and NGOs to address IPV may help reduce the threat of violence against wives.

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