# For Young South Africans, Community Opportunities May Have Unexpected Links to Sexual Behavior

The educational, employment and recreational opportunities available locally to South African adolescents are associated with their sexual behavior, although not always in expected directions or in the same way for males and females, according to a population-based survey in one province.[1] For example, the higher the average wages of adolescents in the community or their level of participation in schooling or sports, the less likely adolescent women were to have had sex in the past year (odds ratios, 0.01–0.6), but the same was not true for adolescent men. Adolescent women's likelihood of condom use at last sex was positively associated with average wages in the community (1.6); however, for adolescent men, the higher the community levels of participation in schooling, work or sports, the lower the odds of use (0.01–0.2).

Researchers interviewed a representative sample of 14–22-year-olds residing in two districts of KwaZulu-Natal Province in 1999. Respondents were asked about their sexual behavior, their education and work experiences, their participation in extracurricular activities (classified as youth programs, sports or religious clubs) and their households. Communities were selected from among census areas, and data for each were obtained by aggregating the individual data from respondents living there. Using logit analysis, the researchers examined associations of individual, household and community factors with two measures of sexual behavior—sex in the past year and use of a condom at last sex in the past year (defined as use at last sex with all of the most recent partners mentioned, up to three). Separate analyses were conducted for males and females.

Analyses were based on 2,992 respondents living in 109 communities. Fifty-six percent of respondents were blacks living in urban areas, and 24% rural blacks; the rest were Indians (14%) or whites (6%). Roughly half of respondents each were female (55%) and 16–19 years old (51%). The majority (74%) were in school; only 10% were working. Modest proportions participated in each of the three extracurricular activities (16–30%). Fifty-eight percent of respondents lived in permanent houses (a measure of household economic status), and 47% had an adult who had at least 12 years of schooling in their household.

On average, 66% of adolescents in each community were in school, but only 7% of those aged 20 or older had completed secondary school. Across communities, an average of 12% of adolescents were working, and their mean wage was about 200 rand (roughly US$30) per week. Levels of participation in extracurricular activities averaged 15–28%.

Overall, 47% of respondents reported having had sexual intercourse in the past year. In analyses including only individual and household factors, the odds of adolescent women's having had sex in the past year were lower for Indians than for whites (odds ratio, 0.2), for women in school than for their out-of-school counterparts (0.2) and for women who had an adult with at least a secondary education in their household than for others (0.6). The odds were higher for 16–19-year-olds and 20–22-year-olds than for 14–15-year-olds (9.3 and 27.6) and for women participating in youth programs than for those not participating in any extracurricular activities (1.9).

When community factors were added to the analysis, these associations remained about the same, and living in a house made of traditional materials, rather than a permanent house, was associated with reduced odds of recent sexual activity (odds ratio, 0.6). In addition, adolescent women's likelihood of having had sex was negatively associated with the proportion of their peers who were in school or had a secondary education (0.01–0.03), community wages (0.6) and levels of participation in sports (0.2).

Among adolescent men, when only individual and household factors were considered, respondents currently in school had reduced odds of having had sex in the past year (odds ratio, 0.4). The odds of recent sex were higher for urban- and rural-dwelling blacks than for whites (4.3 and 4.1), for 16–19-year-olds and 20–22-year-olds than for 14–15-year-olds (10.9 and 29.9), for men who were working than for those who were not (3.0) and for men participating in sports than for those not involved in any activities (2.3). When community factors were also taken into account, these associations, with the exception of that for rural-dwelling black men, remained significant. No community factors were associated with having had sex in the past year.

Of respondents who had had sex in the past year, 47% had used a condom at last sex. Among adolescent women, when only individual and household factors were included in the analysis, the likelihood of condom use was reduced for respondents living in a house made of traditional materials (odds ratio, 0.5) and was elevated for women whose household included an adult with 12 or more years of schooling (1.6). After addition of community factors, only household education remained significantly associated with condom use at last sex. In addition, the higher the community's average wage, the greater the likelihood of condom use (1.6).

Among adolescent men, when only individual and household factors were considered, the likelihood of condom use at last sex was positively associated with working (odds ratio, 2.1) and with household education (2.1). When community factors were added to the analysis, these associations persisted; furthermore, use was reduced among urban- and rural-dwelling blacks (0.1 for each). In addition, condom use was negatively associated with the proportion of adolescents in a community who were in school or had a secondary education (0.01–0.04), were working (0.01) or were participating in sports (0.2).

The researchers comment that prospects for education and employment "shape young people's future plans and expectations," which may in turn affect their decisions about sexual risk-taking. The observed associations between community opportunities and adolescents' sexual behavior may aid the design of interventions to promote safer sex, they note; importantly, such interventions will likely have to be tailored for women and for men. The find-

ings, they conclude, "should encourage researchers studying HIV/AIDS, particularly in high-prevalence settings such as South Africa, to consider a wide range of influences on adolescents' lives, because the context in which adolescents face decisions may be critical to their sexual behaviors."–*S. London*

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## Odds of Penile HPV Are Reduced for Circumcised Men and Condom Users

Men who are circumcised and use condoms consistently may have a reduced risk of carrying human papillomavirus (HPV) on their penises. In analyses of data from a public sexually transmitted infection (STI) clinic in the southwestern U.S. city of Tucson, Arizona,[1] HPV was significantly less likely to be detected on the penises of circumcised men than on those of uncircumcised men (odds ratio, 0.3). Men who reported having always used condoms in the past three months were significantly less likely than nonusers to have HPV detected (0.4).

Study participants were 393 clinic attendees aged 18 or older who were recruited in 2000–2001 and completed a questionnaire about their demographic background, sexual behaviors and risk factors for STIs. Examinations were performed to evaluate clinical characteristics and to swab the surface of the penis for HPV testing. Detection was established if a skin sample contained HPV DNA. The researchers used chi-square tests and multivariate logistic regressions to assess relationships between participants' characteristics and the detection of any HPV and of oncogenic and nononcogenic strains of the virus.

Twenty-eight percent of men tested positive for any type of HPV. In univariate analyses adjusted for age, a significantly lower proportion of 25–29-year-olds than of 18–24-year-olds tested positive for the virus (20% vs. 34%). HPV detection was significantly less common among whites than among Hispanics and participants of other races and ethnicities (21% vs. 33–34%); among men who had some college education than among those who had a high school education or less (21% vs. 35%); and among participants who were circumcised than among those who were not (20% vs. 41%). Men who reported a coital frequency of 30 or more times per month during the past three months tested positive for penile HPV in significantly higher proportions than those who had not had sex at all (52% vs. 24%). HPV detection was also significantly more common among men who had genital warts at the time of the study than among those who did not (46% vs. 27%).

Univariate analyses of condom use and HPV status revealed that the proportion of men who had HPV detected was significantly lower among those who had sometimes used condoms during the past three months than among those who had never used them (25% vs. 37%). Participants who had used condoms at last anal intercourse tested positive for HPV at a significantly lower frequency than did those who had not used protection (14% vs. 41%). HPV detection was also significantly less common among men who sometimes or always used condoms with their steady partner than among those who never used them (15–24% vs. 40%).

Multivariate analyses adjusted for behavioral and clinical factors indicated that circumcised men and consistent condom users were significantly less likely to have HPV detected than were uncircumcised men and nonusers, respectively (odds ratios, 0.3 and 0.4). Participants who had always used condoms in the past three months were significantly less likely than those who had never used them to test positive for HPV (0.4). Having genital warts was significantly associated with elevated odds of HPV detection (2.5), as was a coital frequency of more than 30 times per month in the past three months (3.7). The odds of detection increased significantly with coital frequency.

In multivariate analyses stratified by HPV type, only circumcision remained significantly linked to reduced odds of oncogenic and nononcogenic HPV detection (odds ratios, 0.4 for both). The odds of having nononcogenic HPV detected were significantly elevated among men with genital warts (4.4) and significantly decreased among those who had used a condom at last anal intercourse (0.3). The relationship between HPV detection and a coital frequency of more than 30 times per month persisted in analyses limited to oncogenic strains of the virus (5.0), as did the trend associated with coital frequency and men's odds of HPV detection. Having always used condoms in the past three months was significantly associated with decreased odds of oncogenic HPV detection (0.2).

The researchers acknowledge that their study is limited because it included self-reported condom use data, used skin swabs for HPV testing and was based on a clinic population, who may be at high risk. According to the authors, their findings "suggest that 'classic' risk factors for HPV [such as cumulative number of partners and age at first intercourse] do not apply in men." Moreover, they say, "for prophylactic HPV vaccine efforts, targeted education campaigns, and other future cancer prevention endeavors to be successful, comprehensive knowledge about the epidemiology of HPV in men must be acquired through further studies."–*R. MacLean*

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## Vitamin A Supplementation Erases Gender Disparities In Child Mortality in Nepal

In rural Nepal, a substantial difference in mortality between females and males aged five years or younger was virtually eliminated with community-wide vitamin A supplementation, according to results of a randomized, controlled field trial involving more than 30,000 children.[1] The high-dose supplements also narrowed survival inequalities between caste groups but not those between socioeconomic levels.

For this study, the researchers performed a secondary analysis of data from a cluster-randomized, double-blind, placebo-controlled trial conducted in 1989–1991. During the trial, all children aged 6–60 months in a selected rural district in southeastern Nepal received four home visits, separated by four-month intervals. At each visit, children in communities randomly assigned to receive high-dose vitamin A supplements were administered a capsule with 200,000 IU; the others received capsules containing 1,000 IU. For the current, intention-to-treat analysis, investigators assessed the number of deaths among participants from the first visit to the fourth, and then compared the death rates by gender; caste (the two highest castes—Brahmin and Chettri—combined vs.

all other children); and socioeconomic level (the four highest quintiles in the sample vs. the poorest quintile), measured primarily by household asset ownership.

The trial involved 30,059 children, 49% of whom were female. One-tenth of children had a literate mother. The average household had 1.9 rooms and was a nine-minute walk from the nearest water supply. Fifty-one percent of the children received the high-dose vitamin A supplements.

Overall, 2% of the children died during the study. Among placebo recipients, mortality was substantially higher for females than for males (27 vs. 19 deaths per 1,000 person-years); however, the rates of death among females and males who received high-dose vitamin A supplements were nearly equal (18 vs. 17 per 1,000 person-years). According to logistic regression analysis, death was significantly more common among girls given placebos than among boys given high-dose supplements (odds ratio, 1.6).

Differences in mortality between caste groups were also attenuated with vitamin A supplementation: Without supplementation, the mortality rates were 25 per 1,000 person-years in lower-caste and noncaste families and 11 per 1,000 person-years in high-caste families; with high-dose supplementation, those rates were 19 and 11 deaths per 1,000 person-years, respectively. Compared with high-caste children who received high-dose supplements, children in lower-caste and noncaste families who received a placebo had significantly higher odds of death (odds ratio, 2.2), although this was also the case for lower-caste and noncaste children who received the high-dose supplements (1.6).

In contrast to the results regarding gender and caste, the difference in mortality between the poorest socioeconomic quintile and the four higher quintiles was unaffected by the nutritional intervention: Compared with wealthier children, the poorest children had 13 additional deaths per 1,000 person-years without the high-dose supplementation and had 15 additional deaths per 1,000 person-years with the supplementation. An analysis of treated versus untreated children by quintile showed that although mortality in each quintile was lower among treated children than among nontreated children, mortality in the lowest quintile and in the two highest quintiles differed only nominally—by four or fewer deaths per 1,000 person-years. The benefit of vitamin A supplementation was greatest in the second-poorest quintile and in the middle quintile, where there were 10 fewer deaths per 1,000 person-years among treated children than among untreated children.

The authors believe their finding of a supplementation-related reduction in the mortality difference between castes but not between socioeconomic categories suggests that "dietary vitamin A intake (or the risk of vitamin A responsive disease) in the population was less similar across the lines of caste (more sufficient in Brahmin, Chettri) and more similar across the gradient of asset ownership." In discussing the differing degrees of response to vitamin A supplementation across socioeconomic quintiles, the authors speculate that "the overall mortality hazards of children in the lowest [socioeconomic] quintile include several causes of death that may not be as responsive to vitamin A as diseases among children in the middle of the [socioeconomic] distribution." They also note that there may be "factors among the very poorest children that preclude them from deriving benefit from vitamin A."

Finally, in commenting on the intervention's success in virtually eliminating the mortality differential between young girls and young boys, the authors note that "public health interventions that rely on door-to-door distribution of health services essentially overcome intrahousehold gender biases."—*C. Coren*

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## For Young Mexican Men, Having a Confidant Raises The Odds of Condom Use

In Mexico City, unmarried young men who discuss their personal problems with one, two, or three or more confidants are significantly more likely to have used contraceptives for STI prevention at last intercourse than are men without a confidant (odds ratios, 2.4–2.8).[1] Compared with men who last had sex with a girlfriend, those whose last female partner was neither a friend nor a girlfriend have significantly elevated odds of contraceptive use for pregnancy or STI prevention (4.0). These results underscore the importance of social factors—in addition to individual characteristics—as predictors of contraceptive use among single young men.

Data came from a representative sample of 8,086 men aged 15–60 who were surveyed in 1992–1993. The questionnaire asked respondents about their demographic characteristics and sexual history, contraceptive use at last intercourse, attitudes toward condoms, knowledge and perceived risk of HIV/AIDS, and people with whom they discussed their personal problems. The sample for analysis comprised all unmarried respondents who were younger than 25 and had had sex in the past 12 months. The researchers conducted univariate and multivariate regression analyses to evaluate relationships between social and individual-level variables and contraceptive use at last sex for pregnancy prevention, for STI prevention and for either purpose.

Univariate analyses revealed a number of significant predictors of contraceptive use for pregnancy or STI prevention: a secondary or higher education, having a top-level job or being a student, having a positive attitude toward condoms, perceived lack of risk for HIV infection, high level of knowledge about HIV/AIDS, two cumulative female partners and a coital frequency of once per month during the past year. The odds of contraceptive use were also significantly elevated among men who indicated that they discussed personal issues with two or more people.

Similar results emerged in univariate analyses that distinguished between contraceptive use for pregnancy and STI prevention. Additional predictors of contraceptive use to prevent pregnancy only included having known one's partner for more than one month and being the same age or younger than the woman. The odds of condom use for STI prevention only were significantly decreased among men who had known their partner for more than a month and were significantly increased among those who had last had sex with someone other than a girlfriend.

In multivariate analyses, men who had a secondary or higher education were significantly more likely to have used contraceptives for one or both reasons than were those who had attained less schooling (odds ratios, 2.2–3.3). The odds were also significantly higher among men who had positive attitudes toward condoms than among those with ambivalent or negative attitudes (2.5); among respondents who had had two cumulative partners than among those who had had only one (2.0); and among men with a coital frequency of once per month during the past year than among those with a higher coital frequency (1.5). Having last had sex with someone other than a friend or girlfriend was significantly associated with

contraceptive use for any reason (4.0).

In multivariate analyses that focused on contraceptive use for pregnancy prevention only and for STI prevention only, relationships between use at last intercourse and individual-level variables were similar to those found for the combined outcome. These analyses also revealed that men with one, two, or three or more confidants were significantly more likely to have used condoms to protect against STIs than were those without a confidant (odds ratios, 2.4–2.8). Moreover, limiting the outcome to STI prevention intensified the relationship between contraceptive use and having had sex with someone other than a friend or girlfriend (6.4). Finally, men who had known their partner for more than one month were significantly more likely than those who had known her for less time to have used contraceptives solely for pregnancy prevention (1.8–1.9).

The researchers acknowledge that their study would have been improved if the survey had been specifically designed to capture social context and interactions between partners. Their results, they suggest, indicate that "men are ready to use condoms with women who are not girlfriends or friends, and are motivated to avoid STIs," but increasing men's knowledge of HIV transmission "will be unlikely to change behaviors if their partners are simply not seen to be risky." Moreover, the researchers note, the link between men's use of condoms and their communication of personal matters with others suggests that "programs that aim to enhance communication should be able to increase contraceptive use." Given these findings, they support interventions that "take account of the wider context, and the role of communication and social networks."–*R. MacLean*

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## HIV Infection Elevates Kenyan Sex Workers' STI Risk, Which Rises Further as Immunosuppression Increases

Infection with HIV increases the risk of acquiring other STIs, according to a 10-year prospective study conducted among female sex workers in Kenya.[1] Risks of candidiasis, gonorrhea and genital ulcer disease were significantly higher among HIV-positive women than among HIV-negative women (hazard ratios, 1.5–2.8); the risks of candidiasis and genital ulcer disease rose with increasing levels of immunosuppression.

The prospective cohort study followed 1,215 female sex workers who visited a municipal health clinic in Mombasa, Kenya, from 1993 to 2003. Participants, who had to be HIV-negative, were interviewed for their medical, gynecologic and sexual history. At monthly follow-up visits, they provided data on sexual behavior, contraceptive use and any genital symptoms during the previous month. At each visit, the women were examined and tested for HIV and other STIs, including syphilis, gonorrhea, chlamydia, vulvovaginal candidiasis, bacterial vaginosis and trichomoniasis; the presence of genital ulcer disease (defined as epithelial disruption of the cervix, vagina or vulva) was also assessed.

During the course of the study, 238 of the participating sex workers contracted HIV. Beginning in 1998, the CD4 cell counts of infected participants were measured every three months to monitor the level of immunosuppression.

Proportional hazard models were used to compare the risk of genital tract infections in HIV-positive and HIV-negative women. Models controlled for education, number of children, workplace, douching practices, age, duration of prostitution, number of sex partners, frequency of sex, condom and contraceptive use, and time since last clinic visit. Visits at which women were pregnant were excluded from analysis. To assess how immunosuppression affected STI susceptibility, the study compared STI risk among women with CD4 cell counts of fewer than 200, 200–499 and 500 or more per mcl.

Study participants had a median age of 26 years (range, 22–31), and had a median of eight years of education; their median time as sex workers was one year. Seventy-five percent worked in a bar. The median frequency of sexual activity was two times per week, with one sex partner each week. Sixty-two percent of the women reported always using a condom; 71% douched with soap. About one-third used a hormonal method of birth control, including 20% who relied on the injectable and 14% who used oral contraceptives. The median duration of participant follow-up was 617 days and the time between visits was 35 days.

Compared with HIV-negative sex workers, sex workers who were HIV-positive had significantly increased risks of having genital ulcer disease (hazard ratio, 2.8), gonorrhea (1.6) and vulvovaginal candidiasis (1.5).

The risk of some STIs was associated with declining CD4 cell counts in HIV-positive women. For genital ulcer disease, the hazard ratio rose from 2.5 for women who had a CD4 count of at least 500 cells/mcl to 5.0 for those who had fewer than 200 cells/mcl. For candidiasis, the hazard ratio increased from 0.9 to 2.1. Under a definition of candidiasis that relies on women reporting vaginal itching or discharge when they were specifically asked whether they had these symptoms, the hazard ratio increased to 5.4 for the highest level of immunosuppression.

Condom use also exerted a significant effect on the incidence of genital tract infections in this population. When compared with women who reported using condoms less than 100% of the time, those who always used condoms were at lower risk of gonorrhea (hazard ratio, 0.6), chlamydia (0.6), genital ulcer disease (0.7), cervical mucopus (0.8) and bacterial vaginosis (0.9).

According to the authors, their results provide strong evidence of epidemiological synergy between HIV and genital tract infections in this sample of female sex workers. They note the study's strengths—its large cohort, long follow-up period, high incidence of genital tract infections, repeated screening of participants and long-term monitoring of sexual activity. Nevertheless, they also point out several limitations of the research—possible underreporting of risky sexual behavior that may increase women's exposure to STIs, failure to evaluate the role of sex partners and networks among the sex workers, use of the less sensitive culture method to detect gonorrhea and the fact that genital ulcer disease encompasses a variety of etiologies.

It is still unknown, the authors say, whether HIV infection influences the duration, severity or recurrence of genital tract infections. Because of the prevalence of such infections among HIV-positive women, they recommend "more intensive treatment and prevention of these conditions as a means of decreasing HIV-1 infectivity."–*J. Thomas*

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## Women's Lack of Control In Relationships May Lead To Inconsistent Condom Use

In South Africa, sexually experienced 15–24-year-old females who report low relationship control are more likely to use condoms inconsistently (odds ratio, 2.1) than are those who report high relationship control.[1] Females who have experienced forced sex and those who do not talk to partners about condoms also have increased odds of being inconsistent users (5.8 and 12.9, respectively). In turn, those who report inconsistent condom use are more likely than consistent users to be HIV-positive (1.6).

This study included 4,066 sexually experienced females drawn from a nationally representative 2003 household survey of 15–24-year-old men and women. Participants answered questions on social and demographic factors, HIV risk behavior and two measures of sexual power: degree of relationship control, and experience of forced sex with their most recent partner in the previous year. Relationship control was assessed on the basis of respondents' answers to four questions: whether their partner had more control than the respondent in important relationship decisions; whether he got his way most of the time in arguments; whether he had more control than the respondent over condom use; and whether he had more control over whether the couple had sex. Women who had always used condoms with their most recent partner over the last year were considered to be consistent condom users. All participants were tested for HIV.

Once the sample was weighted to reflect the demographic distribution of 15–24-year-olds in the 2001 census, 88% of participants were black, 64% were 20–24 years old, 73% had not completed high school and 21% were HIV-positive. Thirteen percent had had more than one sexual partner in the past year, and 10% had had sex more than five times in the past month. Seventy-one percent of the participants were inconsistent condom users, and 27% reported low relationship control. Although only 4% reported forced sex in the last year, 10% said they had ever experienced forced sex; the authors believe both proportions are underestimates.

Greater proportions of inconsistent condom users than of consistent users reported low relationship control (33% vs. 14%), forced sex (5% vs. 1%), more than five episodes of sexual intercourse in the last month (13% vs. 4%) and no discussion of condom use with their partner (28% vs. 2%), and they scored lower on condom use self-efficacy (2.2 vs. 2.7 on a scale of 0–3). Inconsistent condom users were also more likely than consistent users to be 20–24 years old (66% vs. 46%) and married (7% vs. 1%), to perceive themselves at high risk for HIV infection (43% vs. 30%) and to have a partner who was 10 or more years older (7% vs. 3%). Moreover, inconsistent users were more likely to have experienced sexual debut before 14 years of age (8% vs. 4%) and to have not completed high school (76% vs. 66%).

The study also found that participants' attributes varied according to their HIV serostatus: Eighty-one percent of HIV-positive females were 20–24 years old (vs. 60% for HIV-negative females), 98% were black (vs. 86%) and 81% had not completed high school (vs. 71%). HIV-positive women were also more likely to have had more than one sexual partner in their life (68% vs. 51%) and to be inconsistent condom users (79% vs. 70%).

Multivariate logistic regression analysis revealed associations among relationship control, condom use and HIV status. Compared with women reporting high relationship control, those with low control had an elevated likelihood of using condoms inconsistently (odds ratio, 2.1). Similarly, women who had experienced forced sex and those who had not talked to their partner about condom use were at increased risk of having used condoms inconsistently (5.8 and 12.9, respectively), as were those who were married (5.4), were 20–24 years old (1.9), reported low condom use self-efficacy (1.9) and had had sex more than five times in the past month (2.9).

Although HIV serostatus was not directly related to the two measures of women's sexual power, it was related to condom use: Inconsistent users had higher odds of being HIV-positive than did consistent users (odds ratio, 1.6). Furthermore, the odds of being HIV-positive were elevated for young women who were black (7.6), were 20–24 years old (2.5), were single (2.1), had not completed high school (2.6) or lived in urban areas (2.4). In addition, participants who reported having had more than one lifetime partner had elevated odds of being HIV-positive (2.5).

Other studies in Africa have examined how women's status or household power may affect contraceptive use, but few studies have looked at sexual power and HIV serostatus among young women. This study considered only two aspects of sexual power—relationship control and experience of forced sex—which may explain why it found no direct association between sexual power and HIV status. However, it did find a significant association between inconsistent condom use and being HIV-positive, and by far the strongest risk factor for inconsistent use was not talking to one's partner about using condoms.

This study thus demonstrated that women with low sexual power were more likely to report using condoms inconsistently, which in turn elevated the likelihood of being HIV-positive. In light of these findings, the authors believe that "efforts to promote consistent condom use, a key element of HIV prevention, would benefit from efforts to enhance women's sexual power," and that improved partner communication would strengthen the sexual decision-making capacity of women.–*J. Thomas*

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## Injectable Use May Increase Women's Odds of Getting Chlamydia or Gonorrhea

The use of progestin-only injectable contraceptives may be linked to an increased risk of chlamydial or gonococcal infection (hazard ratio, 3.6), according to data from women attending two clinics in the eastern United States.[1] In contrast to several existing studies, this study did not find a statistically significant association between oral contraceptive use and the risk of acquiring a cervical infection.

Participants were recruited at one reproductive health clinic in the suburbs of Baltimore, Maryland, and one in the inner city from 1996 to 1999. The sample comprised 819 women aged 15–45 who had not used hormonal contraceptives during their last menstrual cycle or the injectable during the last four months, were not currently pregnant or planning to become pregnant in the next year, and tested negative for chlamydia and gonorrhea at enrollment or after treatment. At baseline and at three-, six- and 12-month follow-up visits, researchers conducted standardized interviews to collect information on participants' demographic characteristics, reproductive history, sexual behavior and contraceptive use. Standardized pelvic examinations were performed to evaluate signs of possible infection:

abnormal discharge, a vaginal pH of 5.0 or greater, cervical friability (i.e., easily induced bleeding) and cervical ectopy (i.e., growth of tissue from the cervical lining out onto the uterus). In addition, specimens were collected for chlamydial and gonococcal testing.

At baseline, women were classified according to whether they chose to initiate the injectable, oral contraceptives or no hormonal method. To examine relationships between the use of each method and women's risk of infection, the researchers conducted chi-square tests and Cox regression analyses using data collected from 1,988 intervals of contraceptive use accumulated over the course of the study.

Roughly one-half of participants came from the inner-city clinic; 52% were white, and 43% were black. At baseline, the majority were younger than 25, single and nulliparous, and had graduated from high school. Roughly half had had six or more partners, and about three-quarters had used condoms in the last three months. Two-thirds had ever used oral contraceptives, and roughly one in 10 women had used the injectable. Five percent tested positive for chlamydia or gonorrhea at enrollment.

At baseline, higher proportions of women who initiated the injectable than of those who initiated oral contraceptives attended the inner-city clinic (56% vs. 30%); were nonwhite (55% vs. 30%), living with a partner (25% vs. 13%) and aged 25 or older (47% vs. 34%); had a high school education or less (47% vs. 34%); had been pregnant in the past 12 months (25% vs. 10%); and had ever had a child (40% vs. 11%). Injectable users reported several risk behaviors in higher proportions than oral contraceptive users: sex with a partner of positive or unknown STI status in the past year (14% vs. 6%), vaginal douching in the last 12 months (44% vs. 25%) and a coital frequency of five or more times per month during the past three months (63% vs. 60%). Abnormal vaginal discharge, high vaginal pH, cervical friability and diagnosis of chlamydia at baseline were also more common among injectable users than among oral contraceptive users (9–47% vs. 3–34%). Among women who chose neither method (controls), 15% had been pregnant in the past 12 months and 35% had ever given birth; 14% had had sex with a partner of positive or unknown STI status, 46% had douched within the last year and 46% reported a coital frequency of five or more times per month. Proportions with abnormal discharge (28%) and cervical friability (34%) were higher than among hormonal contraceptive users, while chlamydial infection was 6% at enrollment.

At follow-up interviews, risk behaviors in the past three months and clinical signs of possible infection tended to be most common among controls, but so was condom use. Differences were also identified between contraceptive use groups: Higher proportions of injectable users than of oral contraceptive users reported having douched (35% vs. 12%) and having had sex with a partner of positive or unknown STI status (8% vs. 6%); lower proportions reported having had two or more partners (9% vs. 11%), a coital frequency of five or more times per month (61% vs. 71%), sex with a new partner (12% vs. 17%) and having used condoms inconsistently (32% vs. 40%). The proportion of women who had abnormal vaginal discharge at follow-up visits was higher among injectable users than among oral contraceptive users (13% vs. 10%), as were the proportions with high vaginal pH (33% vs. 26%) and cervical friability (21% vs. 11%). However, 83% of women who relied on oral contraceptives had at least .04 cm of ectopy, compared with 77% of injectable users.

Bivariate analyses revealed that injectable users had a significantly higher risk of chlamydial or gonococcal infection than did controls (hazard ratio, 2.8). The risk was also significantly elevated among 15–17-year-olds, women who had a high school education or less, nonwhites, inner-city clinic attendees and participants who had been pregnant in the last year (1.6–6.3). Vaginal douching, multiple sex partners in the past three months and inconsistent condom use were significantly associated with an increased risk of infection (2.1–3.5), as were abnormal discharge, high vaginal pH and cervical friability (2.3–2.9).

The relationship between injectable use and women's risk of infection persisted in multivariate analyses (hazard ratio, 3.6). Participants who were aged 15–17, nonwhite and from the inner-city clinic also had a significantly elevated risk of infection (2.7–4.0). The only behavior significantly associated with an increased risk of acquiring chlamydia or gonorrhea was having had multiple partners in the past three months (2.6). The extent of cervical ectopy did not mediate the relationship between injectable use and women's risk of infection. Neither bivariate nor multivariate analyses revealed a significant association between oral contraceptive use and cervical infection.

The researchers acknowledge that their study is limited because they could not randomly assign women to use specific methods and could not ensure follow-up. Although they can only speculate as to how the hormonal injectable may affect women's susceptibility to cervical infection, they say their findings highlight the "need to counsel all women who use hormonal contraception and are not in a mutually monogamous relationship to use condoms consistently and correctly." Moreover, they point out, if further research corroborates their results, counseling for hormonal contraceptive users in settings where STIs are common "might need to be adjusted to reflect these findings."–*R. MacLean*

**REFERENCE**

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## Traditional Gender Roles And Intimate Partner Violence Linked in China

Chinese women whose beliefs and experiences reflect traditional norms that limit gender equality may be at increased risk of being subjected to intimate partner violence.[1] Forty-three percent of women surveyed at a gynecology clinic said they had ever been physically or sexually abused by a partner; 26% reported that such abuse had occurred during the previous year. Several factors that suggest adherence to traditional gender roles were associated with a woman's likelihood of reporting intimate partner violence. For example, women who had ever turned down a job because of their partner had elevated odds of reporting abuse ever or in the past year, as did women who thought that wife-beating is sometimes justified. Those who believed that a wife has a duty to have intercourse with her husband also had elevated odds of saying that they had ever been abused.

The survey was conducted in 2000 among a randomly selected sample of 18–60-year-old women attending a clinic in a major teaching hospital. In face-to-face interviews, women were asked whether a current or former intimate partner had ever subjected them to a variety of forms of physical abuse (e.g., had slapped, kicked, beaten or threatened them), sexual abuse (e.g., had forced them to have intercourse) or psychological abuse (e.g., had insulted or humiliated them). Those who reported any physical or sexual abuse were

categorized as having experienced intimate partner violence. The interviews also elicited information on demographic, behavioral, socioeconomic and cultural factors that may be related to intimate partner violence; possible relationships were assessed through univariate and multivariate logistic regression.

Most of the 600 women included in the analyses lived in urban areas (74%), were married (87%) and had lived with no more than one partner (92%); on average, the women were 31 years old and had had nine years of schooling. Two-thirds were employed (mainly as workers, the lowest status employment category), and three-fourths earned income. Smoking and drinking were reportedly much less common among the women themselves (3% and 13%, respectively) than among their partners (60% and 62%, respectively). Nearly half of women said that they sometimes or often quarreled with their partner; one in eight said that he was engaged in an extramarital affair.

Data on socioeconomic and cultural characteristics suggest varying levels of adherence to traditional patriarchal norms. The majority of women said that they were involved in financial decisions, but two in 10 had turned down a job because of their partner, one in 10 said he had taken money away from them and the same proportion said that he had refused them money. In comparison with their partner, almost half of women had a lower level of education and job status, and one-quarter had a lower income. About 25–40% of women agreed that a good wife obeys her husband, that it is important for a man to show his wife who is boss, that a woman is unable to choose her own friends and that a wife is obliged to have intercourse with her husband even if she does not feel like it. Seventy percent agreed that family problems should not be discussed with outsiders. Responses to scaled items reveal some support for the belief that wife-beating is justified in certain situations and for traditional attitudes toward the woman's role in sexual relations.

Thirty-eight percent of women had ever been physically abused by a partner, and 16% had ever been sexually abused; for the past year, the proportions were 21% and 12%, respectively. Of those who had ever experienced physical abuse, 29% also had been subjected to sexual abuse; of those who had been physically abused in the past year, 24% also had been sexually abused during that time. Overall, 43% of women had experienced intimate partner violence, and 26% had been abused by a partner in the past year.

In the univariate analyses, a large number of measures were significantly related to women's likelihood of reporting intimate partner violence; the results were similar for reports of lifetime and recent experiences. The multivariate analyses identified 11 factors that were independently associated with reports of abuse. Four of these were significantly associated with elevated odds of both lifetime and recent victimization: having a partner who was involved in an extramarital affair (odds ratios, 3.0 and 2.5, respectively), having more than occasional quarrels with a partner (2.8 and 3.2), having refused a job because of a partner (2.1 for each) and holding traditional beliefs about wife-beating (1.5 and 1.3). Two factors were associated with reduced odds of intimate partner violence ever and in the last year: having a partner who worked as a manager or supervisor (0.4 for each), and agreeing that family problems should be discussed only within the family (0.6 for each).

Additionally, the likelihood that women had ever been subjected to intimate partner violence was elevated among those who had lived with two or more partners (odds ratio, 3.1), whose partner had ever been drunk in the past year (2.2), whose partner had refused them money (5.3) and who believed that a wife is obliged to have intercourse with her husband (1.6). One factor was associated with intimate partner violence only in the past year: Compared with women who had grown up and currently lived in an urban or suburban area, those who had grown up in a rural area had higher odds of reporting any abuse (2.0–2.1, depending on their current residential setting).

According to the researchers, given that the majority of women believed that family problems should be kept within the family, the prevalence of intimate partner violence in their sample may underestimate the frequency with which such violence occurs. Furthermore, in the researchers' view, the findings suggest that despite China's social and economic reforms, and the attendant promise of equality for women, many women's lives are still influenced by "the norms of a male-dominated culture to some degree." In light of the associations they found between adherence to those norms and intimate partner violence, the researchers conclude that "one of the main problems for contemporary Chinese society" is realizing the promise of gender equality.–*D. Hollander*

**REFERENCE**

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