

## Preventing Herpes Simplex Virus Type 2 May Reduce HIV Risk Among Some Men Who Have Sex with Men

In a randomized, controlled study of an HIV prevention intervention conducted among high-risk men who have sex with men, HIV infection rates were elevated among those who acquired herpes simplex virus type 2 (HSV-2) during follow-up, particularly within six months of the herpes diagnosis.<sup>1</sup> The risk of herpes, in turn, was elevated among black men and among men who engaged in certain risky behaviors; it was not reduced among those who participated in the intervention.

The study, which was carried out in six U.S. cities from 1999 to 2003, recruited HIV-negative men who were at least 16 years old, had had anal sex with a man in the year before enrollment and were not in a mutually monogamous relationship of two or more years' duration with an HIV-negative partner. Participants who were assigned to the intervention received individualized counseling in 10 hour-long sessions over 4–6 months, followed by quarterly maintenance sessions; those assigned to the control group received standardized pretest and posttest counseling and semiannual HIV tests. At six-month intervals, participants completed audio computer-assisted self-interviews about their sexual risk behavior since the previous interview, and provided blood samples for HIV and herpes testing. HSV-2 infections acquired during follow-up were categorized as recent incident at the visit at which they were detected, remote incident at visits within the next 24 months and prevalent at all subsequent visits. The analyses were based on the 3,909 participants for whom valid HSV-2 tests were available (91% of the cohort). These men were about evenly divided between the intervention and control groups; in both, the median follow-up time was 36 months.

Twenty percent of men in the analytic sample had HSV-2 infection when they entered the study, 75% were seronegative throughout the study and 4% acquired the virus during follow-up; the incidence of HSV-2 did not differ between the intervention and

control groups. After conducting univariate regression analyses to identify potential predictors of herpes infection, the researchers performed multivariate hazard analyses to assess independent associations. These calculations confirmed that the likelihood of acquiring HSV-2 was similar for those assigned to the intervention and controls. Black men were significantly more likely than whites to become infected during follow-up (hazard ratio, 1.9), and those who reported having had unprotected receptive anal intercourse five or more times since the previous interview were more likely to do so than were those who said they had not engaged in this behavior (2.6). The likelihood of HSV-2 acquisition also was raised among men who, in the last six months, had had an HIV-positive male partner (1.6) or had had six or more partners (1.5).

Overall, the rate of HIV acquisition during follow-up was 1.9 per 100 person-years. Rates were significantly higher, however, among participants with herpes infection—6.9 per 100 person-years among those with recent incident infection, 6.8 per 100 among those with remote incident HSV-2 and 2.7 per 100 among those with prevalent infection. In analyses controlling for study arm, study site, age, race and a variety of risky behaviors, men with recent incident HSV-2 infection and those with prevalent infection were significantly more likely than those who remained free of HSV-2 to acquire HIV (hazard ratios, 3.6 and 1.5, respectively). Remote incident herpes infection was associated with an increase in the likelihood of HIV acquisition in the univariate analysis, but not in the multivariate analysis.

Twenty participants acquired both HSV-2 and HIV during follow-up; seven had the HSV-2 diagnosed before the HIV, and 13 had both infections detected at the same visit. No herpes infections were detected after an HIV diagnosis, because participation in the study ended if a man tested positive for HIV. The researchers note that distinguishing between a causal association and simultaneous acquisition of the two infections “is

very difficult and would require very frequent HSV-2 and HIV testing.”

Given that the behavioral intervention was not associated with a reduced risk of HSV-2 acquisition, the researchers stress the need for studies to evaluate other prevention approaches, including education, counseling and potential vaccines. Furthermore, they conclude that HSV-2 infection is an important risk factor for HIV acquisition in this population and therefore “appears to be an important target for HIV prevention interventions.”—D. Hollander

### REFERENCE

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## **Upward Mobility Benefits White Women's Infants, But Not Black Women's**

Children born to white women who grew up in poverty but whose economic situation improved by adulthood have reduced odds of being low-birth-weight; in an analysis of data from the National Longitudinal Survey of Youth (NLSY), this association was unaffected by the inclusion of maternal background characteristics and health-related behaviors during pregnancy.<sup>1</sup> The same relationship does not hold for infants born to blacks, however. Rather, their likelihood of being low-birth-weight is associated with maternal marital status, household composition at the time of the birth and weight gain during pregnancy.

The NLSY followed a sample of young people from 1979 through 2002. To study the effect of women's upward socioeconomic mobility on their infants' birth weight, the researchers used data from respondents who had been 14–22 years old in 1979, had lived at age 14 in a poor household (i.e., one in which family income was less than 200% of

the federal poverty line) and had given birth at least once by 2002. Because they were interested in racial differences in this effect, they conducted separate analyses for whites and blacks; the analytic sample consisted of 574 births to white women and 1,270 births to blacks.

Among chronically poor women, both whites and blacks had family incomes of about \$19,000–20,000 in adulthood. Some 37% of births to whites in this category were to never-married women, and 47% were to currently married women; among blacks, the proportions were 74% and 15%, respectively. Sixty-two percent of births to chronically poor white women occurred in households that included the woman's spouse or partner, 23% in households that included one of the baby's grandmothers and 11% in households that included one of the baby's grandfathers. Twenty-two percent of births to comparable blacks were to women who lived with their spouse or partner, 47% to women who lived with their baby's grandmother and 16% to women who lived with their baby's grandfather.

Upwardly mobile white women (those whose family income in adulthood was at least 200% of the federal poverty level) had a median income of \$50,399, and their black counterparts had a median income of \$43,952. Among whites, the vast majority of births (93%) were to married women, and 4% were to never-married women; 65% of infants born to blacks had married mothers, and 30% were born to never-married women. Ninety-five percent of births to whites and 70% of births to blacks were to women who lived with their spouse or partner, 6% and 18% were to women who lived with the baby's grandmother, and 2% and 6% were to women who lived with the infant's grandfather.

Nearly half of babies born to chronically poor white women had mothers who had smoked while pregnant, and one-third had mothers who had consumed alcohol; for infants born to black women, the proportions were three in 10 and one-quarter, respectively. These behaviors were generally less common among upwardly mobile mothers. Regardless of mother's race, three-quarters of births to chronically poor women and nine in 10 of those to upwardly mobile women had been preceded by an adequate level of prenatal care (i.e., care had begun in the first trimester). The proportion

of births to women who had gained an inadequate amount of weight during pregnancy (as determined by a national standard based on prepregnancy body mass index) was four in 10 for black women who had not moved out of poverty and one in four for all other groups. Among infants born to chronically poor women, 12% of whites and 15% of blacks were low-birth-weight (less than 2,500 g at birth); among those born to upwardly mobile women, 5% and 10% were in this category.

In a logistic regression analysis that controlled for maternal background characteristics, the odds that infants born to white women were low-birth-weight declined by 52% for every one-unit increase in the natural logarithm of adult family income. The result was essentially unchanged in models that took into account the household composition at the time of the birth (i.e., the presence of the mother's spouse or partner, and of one of the infant's grandparents), the mother's health-related behaviors during pregnancy and the adequacy of her weight gain during pregnancy. When all of these factors were controlled for, the odds of low birth weight declined by 48% as the woman's family income increased and were nearly tripled if the woman had smoked while pregnant.

For infants born to blacks, by contrast, the likelihood of low birth weight was not significantly associated with the woman's adult family income. However, in each multivariate model, it was negatively associated with the woman's being married (odds ratio in the complete model, 0.4), living with a spouse or partner (0.5) and living with a grandmother of the infant (0.5). The odds of low birth weight were sharply elevated if the mother had gained an inadequate amount of weight during pregnancy (3.7).

"This study," the researchers remark, "provides preliminary evidence that unlike white women, black women are unable to translate upward socioeconomic mobility into beneficial birth outcomes." However, they add, "it does not explain why this is so." Although limitations of the data prevented them from exploring the reasons, they conjecture about a number of possibilities—factors that reduce black women's material resources, such as housing segregation; stressful psychosocial experiences, such as responses to discrimination, that may have adverse health effects and reduce the bene-

fits generally associated with upward mobility; and early health deterioration among black women, which may increase the risk of poor outcomes among those who postpone childbearing.—D. Hollander

## REFERENCE

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## **Positive Attitudes Toward Condom Use Do Not Equal Safer Sex Among Teenagers**

Adolescents who have sex with casual partners tend to have riskier attitudes toward condom use than those who have only main partners, according to a survey of sexually active adolescents in three major U.S. cities.<sup>1</sup> However, risky sexual behavior is not limited to casual relationships: Respondents had used condoms in fewer than half of their reported sexual encounters, regardless of partner type.

The data come from a study of adolescents aged 15–21 in Atlanta, Providence and Miami. Primary care clinic patients and adolescents contacted through various outreach strategies were included if they had had heterosexual vaginal or anal intercourse in the past 90 days, had not given birth within that time period, were not pregnant or HIV-positive, and were not trying to become pregnant. The 1,316 participants were, on average, 18.2 years old; 43% were male, and 57% female. Forty-nine percent of participants were black, 23% white, 8% of another race and 20% multiracial; 24% were Hispanic.

The researchers collected information on participants' demographic characteristics, unprotected sexual behavior, drug and alcohol use, and attitudes toward and perceptions about condom use. For all analyses, participants were classified by whether they had had sex only with main partners (defined as people with whom they had an ongoing relationship) in the past 90 days or they had had sex with at least one casual partner (someone they did not classify as a main partner). Adolescents in the latter group may have also had sex with a main partner, but were asked about behavior with casual partners only.

Some 35% of adolescents in the study reported having had at least one casual sex

partner. These adolescents had had an average of 3.2 sex partners in the past 90 days; by comparison, those in the main partner group had had 1.3 partners. Only participants' gender and living arrangements were associated with partner type: Males made up 61% of adolescents with casual partners and only 34% of those with main partners; and the proportion of adolescents living with their partner was twice as high among those with a main partner as among those with a casual one (21% vs. 10%).

In bivariate analyses, adolescents who had had sex with casual partners had used marijuana or alcohol significantly more often in the past 30 days than had adolescents who had had sex with main partners. Those reporting experience with casual partners also harbored riskier attitudes toward condom use than those with main partners, according to scales that measured how adolescents felt about using condoms; their perception of how their casual partners would react if they suggested using condoms; their perception of their partners' STD status; and their perception of peer attitudes toward abstinence, sexual activity and condom use.

Adolescents in the casual partner group used condoms during a significantly greater proportion of sex acts in the past 90 days than did those in the main partner group, though levels of use were low among both groups (47% and 37%, respectively). According to results of a multiple linear regression analysis, among adolescents in the main partner group, being older and living with a partner were negatively associated with the proportion of sex acts that were protected, while using alcohol or marijuana, having positive attitudes toward condoms and perceiving that main partners would react positively toward condoms were associated with using condoms in a higher proportion of sex acts. Among participants in the casual partner group, being male and the use of drugs other than marijuana were negatively associated with condom use; perceptions that a main partner would react positively toward condom use predicted a higher proportion of sex acts using a condom.

The average number of unprotected sex acts was 18.9 among those who had had main partners and 21.5 among those who had had casual partners. In a multiple linear regression analysis, living with a partner and using drugs other than marijuana were positively

associated with the number of unprotected sex acts among adolescents reporting main partners. Unexpectedly, less risky attitudes toward condoms and perceptions of positive reactions toward condoms among main partners were also positively associated with unprotected sex acts among those in the main partner group. Among adolescents with casual partners, only living with a partner bore a significant (positive) relationship to unprotected sex.

The researchers point out that the frequency of condom use these adolescents reported with either partner type was not sufficient to prevent the spread of STDs. Furthermore, although the perception of main partners' attitudes about condoms was associated with behavior among participants in the main partner group, there was no apparent link among participants in the

casual partner group between their perceptions and their behaviors with casual partners. The researchers encourage clinicians to emphasize the importance of condom use among "all partners regardless of the patient's feelings about the partner, the sense of commitment, or the length of relationship." They also note that their definitions of "main" and "casual" partners may not have captured important aspects of adolescents' relationships. Thus, they suggest that future research "continue to explore the definitions of partner type" in order to fully illuminate the association between risk behaviors and relationship type.—*H. Ball*

#### REFERENCE

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## Dating and Nondating Relationships Among Sexually Active Adolescents Are Often Surprisingly Similar

Sexually active teenagers who are not in a dating relationship most often have sex with other adolescents whom they know well, according to a study of seventh, ninth and 11th graders in Lucas County, Ohio.<sup>1</sup> Although 61% of sexually active adolescents surveyed had had sex with someone who was not their boyfriend or girlfriend, only a very small proportion of this group had engaged in sex with strangers, and fewer than one-quarter had had sex with people they considered to be only acquaintances. Teenagers' nondating relationships were similar to their dating relationships in many ways: In each context, partners tended to be of similar ages, to have known each other for at least a month, to tell their friends about the relationship and to see each other exclusively.

The researchers drew upon the Toledo Adolescent Relationships Study, which provided data on the sexual relationships of 1,316 adolescents who were randomly selected from the year 2000 enrollment records of seven Ohio school districts. The researchers note that Lucas County's demographic and socioeconomic profile is similar to that of the United States. Adolescents who had had sex in the past 12 months were asked to describe aspects of their relationships at the time they and their partners began having sex, including partner type (acquaintance,

friend, best friend, girlfriend or boyfriend, former girlfriend or boyfriend, someone they did not know or "other"), the length of their relationships, the age gap between themselves and their partners, levels of exclusivity and various attitudes toward sex partners.

Some 30% of the sample (32% of males and 27% of females) reported having ever had sex. Within this group, 61% (69% of males and 52% of females) had had a nondating sexual relationship; 74% of these nondating adolescents had had a sexual relationship with a friend, while 63% had done so with a former girlfriend or boyfriend.

Among the teenagers who had had a nondating sexual relationship in the 12 months prior to the survey, 6% had had sex with someone they did not know, 23% with an acquaintance, 14% with a former boyfriend or girlfriend, and 48% with a friend. A significantly greater proportion of males than of females reported a nondating relationship with someone they had previously dated (16% vs. 12%) or a stranger (7% vs. 5%), while a significantly larger proportion of females than of males had relationships with acquaintances (25% vs. 22%), friends (49% vs. 47%) or people they went out with occasionally (9% vs. 4%). On average, adolescents in dating and nondating relationships did not differ significantly in the

length of time they had known their sexual partners, although a larger proportion of nondating teenagers had known their partner for one year or longer (32% vs. 11%). Patterns of age disparity between adolescents and their sex partners were similar among those in nondating and dating relationships: Sixty-two percent of nondating and 53% of dating participants reported having had a sex partner whose age was within one year of their own, while 28% and 33%, respectively, reported a 1–3-year age difference. Among adolescents in both types of relationships, females tended to have known their partners longer than males; females also tended to be farther in age from their partners.

Adolescents' attitudes toward their sex partner and relationship differed significantly according to dating status. Larger proportions of dating than of nondating teenagers felt that sex brought them closer to their partner (67% vs. 32%), told friends about the relationship (92% vs. 67%) and were in an exclusive relationship (56% vs. 47%). However, the researchers point out, the large proportions of teenagers who reported having made their nondating relationships public and who felt that they and their nondating sexual partners were seeing each other exclusively indicates that nondating relationships may not be any more impersonal or fleeting than dating relationships. Along the same lines, 48% of nondating adolescents had had sex with their partner multiple times, rather than engaging in one-night stands. Furthermore, although the majority of dating adolescents were in monogamous relationships, nearly half were not, indicating that exclusivity is not a defining characteristic of either type of relationship.

According to the researchers, "a simple dichotomy (dating vs. nondating) does not adequately reflect teenagers' interpretations of the nature and meaning of their relationships or the impact of sexual intimacy." They suggest that despite traditional assumptions to the contrary, nondating relationships may confer some of the developmental benefits that adolescents are thought to derive primarily from dating. To better understand the implications of relationship type for adolescents' emotional well-being, maturation and sexual risk-taking behaviors, the researchers encourage "recognizing the differences in these relationship contexts . . . [and] exploring some of the variability evident within each type of relationship."—*H. Ball*

## REFERENCE

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## Emergency Department Patients May Need Contraceptive Outreach

A majority of 18–55-year-old women who visited an emergency department were at risk of pregnancy, and only a quarter of these patients were currently using birth control pills, according to a recent study at an urban hospital in Rhode Island.<sup>1</sup> Patients were more likely to use birth control pills if they had private health insurance than if they had public or no insurance, and were more likely to do so if they had had recent intercourse than if they had not. The likelihood of using oral contraceptives declined as women's age increased. Furthermore, women who had had an abortion and those who were more informed about emergency contraception were more likely to use emergency contraceptives than were those who had never had an abortion and those who knew less about this contraceptive method, respectively. The researchers believe that women who might benefit from reproductive health interventions in emergency departments can be identified and thus offered appropriate referrals or contraceptive services.

The investigators examined women's use of and knowledge about birth control pills, emergency contraceptives and condoms, and their risk of getting pregnant, in an effort to improve the reproductive health services available to emergency department patients. (The few studies that have assessed the effectiveness of such interventions in emergency departments, the researchers observe, have been limited to emergency contraception.) The sample included 539 English-speaking women aged 18–55 who visited an urban emergency department in 2002–2003; they answered questions on their demographic characteristics, sexual and pregnancy history, and contraceptive use and knowledge. Characteristics showing a statistical association with contraceptive use at  $p < .05$  in univariate analyses were included in multivariate analyses.

In all, 59% of the women were at risk of pregnancy (not currently pregnant, not

using a nonsurgical form of birth control other than condoms, and having no history of tubal ligation or hysterectomy). Of these women, 76% were aged 18–35, 63% were white, 52% were single, 49% were Catholic and 63% had private health insurance. Twenty-six percent were currently using birth control pills, 10% had used emergency contraceptives and none were using other methods besides condoms; 23% had had an abortion. Nearly half reported having had intercourse in the week prior to the survey; 18% said they always used condoms, and 39% said they never did. Nearly six in 10 women who were at risk of pregnancy had ever been pregnant.

Levels of contraceptive knowledge among women at risk of pregnancy were high: Eighty-nine percent of these women correctly answered all three questions asked about birth control pills (who should take them, why and how often), and 93% correctly answered the same questions about condoms. In contrast, only 32% correctly answered the question on emergency contraception—“If a woman has had vaginal sexual intercourse with a man (without using birth control), can she take birth control pills *afterwards* to prevent pregnancy?” Fewer than one in 10 women at risk of pregnancy believed that birth control pills cause abortions or conflict with their moral or religious beliefs.

In multivariate analyses involving women who were at risk of pregnancy, the likelihood of using oral contraceptives fell as women's age rose (odds ratio, 0.5), while the likelihood was higher among women with private insurance than among those with public or no insurance (2.5), and among those reporting intercourse in the last week than among those who had not had intercourse recently (1.6). Women who had had an abortion had elevated odds of having used emergency contraceptives (2.6), as did women who had correctly answered the question on this method (3.2). Among all 500 patients who had had sexual intercourse, regardless of their current pregnancy risk status, the odds of reporting more frequent use of condoms declined with increasing age (0.6), and were reduced among married women and others with a male sexual partner (0.4), and among those who had had recent intercourse (0.8).

The researchers believe that because a large proportion of women who visit



emergency departments are of reproductive age, and because many of them are at risk of getting pregnant unintentionally, it is critical that this population have access to and knowledge about contraceptives, especially women who rely on these departments as their main source of care. The researchers acknowledge several limitations of the study, including that the sample was drawn from a single urban emergency department and was limited to English speakers. Nonetheless, according to the investigators, these findings on emergency

department patients have identified “groups of women who might benefit from expanded educational and outreach programs . . . to improve their use of reproductive health choices,” particularly women who do not have private insurance, those who have frequent intercourse and those who are older.  
—*J. Thomas*

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## Women's Odds of Choosing Abortion Linked To Affective and Relationship Characteristics

A range of contextual and affective characteristics may be critical dimensions of a woman's decision to have an abortion, according to findings from a clinic-based study of women obtaining abortions or prenatal care in the New Orleans area.<sup>1</sup> Abortion patients scored higher than prenatal patients on a scale measuring how hard the women had tried to avoid pregnancy and lower on a scale reflecting how surprised they were about the pregnancy. Significantly smaller proportions of the former than of the latter said that they wanted a baby with their partner and that he wanted one with them. Multivariate analyses confirmed the association between these measures and the abortion decision.

The study was based on data from a self-administered survey conducted in 2002 at a suburban abortion clinic that served inner-city New Orleans women, and an interviewer-administered survey conducted in 2002–2003 at a prenatal screening clinic that is the first stop for women seeking free care during pregnancy. To ensure the comparability of the samples, the analysts included in their calculations only black women who lived in New Orleans—142 abortion patients and 464 prenatal patients.

Participants from the two clinics were similar with respect to age (61–65% were in their 20s) but differed significantly on other demographic characteristics. Higher proportions of abortion patients than of prenatal patients were not in a relationship, had at least a high school education and were employed; a lower proportion described themselves as religious.

The groups also differed on all cognitive, affective and contextual measures studied. Only 1% of abortion patients said that the pregnancy had occurred at the right time, and the same proportion reported that they had planned to get pregnant; among prenatal patients, 35% and 22%, respectively, gave these answers. On average, abortion patients scored higher than prenatal patients on scaled measures reflecting how hard they had tried to avoid conceiving, how confused they had felt when they learned of the pregnancy and how scared they had felt at that time; they scored lower on scales measuring their happiness and their surprise about the pregnancy, and their belief that the pregnancy would improve their relationship with their partner. Only 4% of women seeking abortion said that they wanted a baby with their partner, and 13% reported that their partner wanted one with them, compared with 51% and 69%, respectively, among prenatal care patients.

When women seeking an abortion were asked to indicate all of their reasons for doing so, the most common response (given by 48%) was that they could not afford a child; 40% of women said that they were not ready for a child, and 36% that they wanted no more children. Roughly 20–30% replied that they were not married, they were in an unstable relationship or they were too young; 11% said that they had terminated their relationship with their partner. Smaller proportions considered themselves too old; cited marital, legal or health problems; or said that the pregnancy had resulted from their first act of intercourse.

In a series of multivariate logistic regression analyses, the researchers examined first the demographic characteristics associated with the decision to have an abortion, then the cognitive, affective and contextual characteristics, and finally all of these characteristics simultaneously. Although the initial model indicated that relationship status, religiosity, education and employment status all were related to a woman's odds of choosing abortion, only educational level and employment remained significant in the model that took all of the variables into account. Women who had a high school education or more were significantly more likely than those with less than 12 years of schooling to choose abortion (odds ratios, 7.8 and 9.8); employed women had twice as high odds of seeking abortion as those who were not working.

Results for cognitive, affective and contextual characteristics were similar when they were assessed alone and in conjunction with demographic characteristics. In the full model, the odds that a woman decided to have an abortion increased significantly with her level of effort to avoid pregnancy (odds ratio, 1.3) and decreased as her level of surprise at becoming pregnant rose (0.7). Women who wanted a baby with their partner and those who said that their partner wanted a baby with them had sharply reduced odds of having an abortion (0.1 for each).

While the analysts recognize that their findings are limited by a lack of generalizability and by differences in the way in which the survey was conducted in the two clinics, they contend that the results have practical implications for reproductive health care providers. In helping women to make appropriate decisions regarding family planning and abortion, they suggest, providers “should explore the broad range of contextual, affective, and cognitive dimensions that influence the women's decisions.” The analysts conclude that an improved understanding of these dimensions “may ultimately contribute to improved prevention of unintended pregnancy and, thus, reduce recourse to abortion.”—*D. Hollander*

### REFERENCE

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## Overall, Postmenopausal Use of Combined Hormones Is Not Associated with Increased Risk of Cervical Cancer

Postmenopausal women who take hormones combining estrogen and progestin have cellular abnormalities detected in the cervix more frequently than nonusers of hormone therapy do, but the risk of precancerous lesions and cervical cancer does not differ between users and nonusers, according to a report based on six years of data from the Women's Health Initiative.<sup>1</sup> Unmarried women, particularly those who are sexually active, have a significantly elevated risk of developing precancerous abnormalities or cervical cancer.

The Women's Health Initiative enrolled nearly 200,000 postmenopausal women aged 50–79 in 1993–1998, of whom about 17,000 participated in a clinical trial of oral estrogen plus progestin. To be eligible for participation in the hormone trial, a woman had to have a uterus; have no history of breast, endometrial or nonmelanoma skin cancer; and have no history of other cancers within the past 10 years. Women who had ever had invasive cervical cancer were excluded from the analysis of cervical cytologic abnormalities. Participants who had a Pap smear at baseline or in the previous year that detected no abnormalities or only low-grade lesions (which are not precancerous) were randomly assigned to receive either combination hormone therapy or a placebo. The study protocol called for participants to have annual pelvic examinations including cervical smears; those with data at three and six years after enrollment (15,733 women) were included in the analysis.

At baseline, 98% of women had normal Pap smear results, and 2% had abnormalities (most of which were low-grade). On average, women with normal results were

significantly older than others (63 vs. 62 years) and had a lower waist-to-hip ratio; they had experienced menarche at an earlier age and had first given birth at a later age. The two groups did not differ with respect to other characteristics that may be risk factors for cervical cancer. In both groups, the majority of women were white, were married (or living as married) and had had at least some postsecondary education. Three-quarters of women had never used hormone therapy, and fewer than one in 10 were using it when they entered the study. Half had never smoked, and one in 10 were current smokers; two-thirds reported that they drank alcohol, and half of these said that they had no more than one drink a week. The majority of women had given birth.

During follow-up, the annual incidence of any new cellular abnormality was significantly higher among women who had had an abnormal result at baseline (653 per 10,000 person-years) than among those who had not (146); the same was true for the incidence of high-grade (precancerous) lesions and cervical cancer. Women taking combined hormones had a significantly higher annual incidence of new abnormalities (179 per 10,000 person-years) than those in the placebo arm of the trial (130), and sexually active unmarried women had a higher incidence (20 per 10,000 person-years) than both unmarried women who were not sexually active (11) and married women (five).

After identifying characteristics that were significantly related at the univariate level with the risk of any abnormalities during the follow-up period, the researchers conducted multivariate analyses to determine which

ones had independent associations. According to these calculations, the risk of abnormal cervical smear results was significantly elevated among unmarried sexually active women (hazard ratio, 1.4), women who had been younger than 30 at first birth (1.7) and users of hormone therapy (1.4).

Over the six years of follow-up, 54 women developed high-grade lesions or cervical cancer. Results of multivariate analyses identified only one significant predictor of this outcome: marital status and sexual activity. Unmarried women had a higher risk than married women of developing precancerous lesions or cancer; the elevation in risk was greater for those who were sexually active (hazard ratio, 3.5) than for those who were not (2.3). The researchers speculate that these findings reflect unmarried women's increased chances of having new sexual partners and being exposed to human papillomavirus. However, the study did not gather sufficient information about women's sexual history for a detailed examination of its relationship to the risk of high-grade abnormalities or cervical cancer.

The researchers point out that their results "are generalizable to postmenopausal women who have recently had a normal cervical smear or a smear with low-grade abnormalities, but they are not applicable to postmenopausal women who have never been screened or have not recently been screened." Despite the study's limitations, the investigators conclude that "sexually active unmarried elderly women may benefit from continued cervical cancer screening."—D. Hollander

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