Combined Use of Condoms with Other Contraceptive Methods Among Inner-City Baltimore Women

By John S. Santelli, Mary Davis, David D. Celentano, Aria Davis Crump and LaWanda G. Burwell

Data from a street survey conducted among 717 women aged 17–35 in two inner-city Baltimore communities in 1991–1992 indicate that 17% of the entire sample, 38% of women using the pill and 11% of users of methods other than the pill used a condom in addition to another method the last time they had intercourse. Although adolescents reported the highest rate of combined condom and pill use (22% of 17–19-year-olds), condom use was significantly associated with pill use among adult women (odds ratio of 1.57) but not among adolescents (odds ratio of 1.03). Condom use was negatively associated with use of methods such as the diaphragm, the IUD, the implant and the sponge (odds ratio of 0.21) among both adolescents and adults. Logistic regression analyses show that positive attitudes toward safer sex, ever having refused sex without a condom and believing in condom efficacy all significantly predicted use of the condom with another method. Having ever been tested for HIV was negatively related to combined use, while behavioral risk factors showed no association. (Family Planning Perspectives, **27:**74–78, 1995)

Increases in sexually transmitted diseases (STDs) and the current human immunodeficiency virus (HIV) pandemic have caused many in the family planning community to reassess the need for consistent barrier protection against STDs, even when a couple practices effective nonbarrier contraception.[1] The risk of acquiring an STD is highest among adolescents, followed by young adults aged 20–24 years.[2] Risk factors for STD acquisition include initiating sexual activity at a young age, changing partners frequently or having multiple concurrent partners, using barrier methods inconsistently, having poor access to STD treatment services, and being a member of a core population with very high STD prevalence rates.[3]

Correct and consistent condom use offers the best protection against HIV and other STDs, after abstinence and mutual monogamy.[4] Adolescents have the highest age-specific rates of condom use, and were the only age-group in which use increased during the 1980s;[5] nonetheless, many teenagers never use condoms or do so inconsistently.

The use of hormonal methods may influence the risk of HIV and other STD infection through behavioral factors, such as nonuse of condoms, or through physiological mechanisms, such as increased cervical ectopy or changes in cervical mucous. For example, research has shown a positive association between pill use and cervical infection, and a possible positive association between pill use and HIV infection.[6]

A few studies have looked at combining condom use with other contraceptive methods. Mosher and Pratt analyzed data from the 1988 National Survey of Family Growth and found that 12% of women whose partners used condoms were also using a contraceptive method themselves—either the pill, sterilization, the IUD or the diaphragm.[7] This group, however, represented only 3.3% of all the women surveyed.

Results of two studies of primarily minority women indicated that the partners of women who had been surgically sterilized used condoms much less frequently than the partners of women who had not been sterilized.[8] In a study among older adolescent women who received the pill through a family planning clinic, Weisman found that only 16% used condoms consistently, although 30% were at a high risk for acquiring an STD because they had had multiple partners.[9] Results of a study among new contraceptive implant users indicated that less than half of these women intended to use condoms.[10]

There is an urgent need to understand condom use and the risk of STDs, including HIV, in relation to contraceptive practice and pregnancy intentions. The present study examines the use of a condom (for STD prevention) in conjunction with another contraceptive to determine the prevalence of combined method use, and the demographic, attitudinal and behavioral correlates of combined use.

Methods

We surveyed women of reproductive age on the street in two inner-city, minority Baltimore communities as part of an evaluation of the effects of a community-based, perinatal HIV prevention program that used street outreach workers and small media materials (i.e., comic books, newsletters and pamphlets).[11] To increase the statistical power of the analysis, we combined data from the intervention and comparison communities collected during rounds two (1991) and three (1992) of a four-year study. (Analyses done in 1991 and 1992 indicated that patterns of contraceptive use were similar in the two communities, although condom use was higher in the intervention community in 1992, 40% versus 27%.) Black female interviewers conducted face-to-face interviews with 1,168 women in 1991 and 1992. All the survey instruments were reviewed and approved by the project's Community Review Panel and the Committee on Human Research of the Johns Hopkins School of Hygiene and Public Health.

Eligible respondents were community residents (determined by postal zip code and community name) aged 17–35 years. A modified street intercept approach was used for sampling.[12] We divided each community into geographic segments that reflected natural boundaries and population density. Interviewer pairs were randomly assigned to these segments daily, with interviewing time assigned in proportion to population density. The interviews were conducted in the afternoon and early evening, and the interviewer pairs were requested to meet daily quotas and to employ a sampling strategy to interview equal proportions of women in the following three age-groups—17–19 years, 20–24 years and 25–35 years. All interviewees were compensated for their

John S. Santelli is medical epidemiologist and LaWanda G. Burwell is project director at the Baltimore City Health Department. Mary Davis and Aria Davis Crump are research associates, and David D. Celentano is professor, all at the Department of Health Policy Management, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md. The research on which this article is based was supported by the Centers for Disease Control Cooperative Agreement #U62/CCU203006–05, Perinatal HIV Reduction and Education Demonstration Activity.

Table 1. Percentage distribution of women interviewed in a street survey of attitudes toward condom use and STD risk, by characteristic, Baltimore, 1991–1992

Characteristic	All (N=775)	Adolescents (N=320)	Adults (N=455)
Age			
17–19	41	100	na
20–24	31	na	53
25–29	18	na	30
30–35	10	na	17
Marital status			
Never married	84	97	75
Married	8	2	12
Divorced, separated, widowed	8	1	13
Race			
Black	96	94	97
Other	4	6	3
Ever pregnant			
Yes	60	42	72
No	40	58	28
Years of education			
<12	35	44	28
≥12	65	55	72
Currently employed			
Yes	45	34	54
No	55	66	46
Lives in subsidized housing			
Yes	40	39	40
No	60	61	60
Total	100	100	100

Notes: na=not applicable. Includes 58 women for whom data on contraceptive and condom use at last intercourse were missing.

participation in the 20–30 minute interview by either $5 in cash or a $5 gift certificate. The response rate among all women approached by the interviewers was 68% in 1991 and 77% in 1992.

For the current analysis of combined contraceptive use, we excluded women who were currently pregnant or who had been pregnant the last time they had intercourse (N=204), women who had been surgically sterilized (N=173), and those who were trying to become pregnant (N=16). Contraceptive use data were also missing for 58 women. Thus, our analysis is based on a final sample size of 717 women. We excluded surgically sterilized women from this analysis because we had already studied their condom use.[13] Pregnant women were excluded because they were not consistently asked about their use of condoms.

Since the sample was a population targeted for a perinatal HIV prevention project, the survey instrument queried respondents' HIV knowledge, attitudes and risk behaviors, as well as their awareness of the project materials and messages. (Members of the comparison community were queried to detect any spillover caused by migration between the two communities.) The questionnaire items were adapted from national surveys, with input from results of focus groups conducted with members of the target population.

Respondents were asked to name the method of pregnancy or STD prevention they had used the last time they had intercourse. They were then asked whether any additional method was used; this follow-up question was repeated until no additional methods were reported. For each method reported, respondents were asked if they were trying to prevent pregnancy, STDs, or both. Combined use was defined as the use of condoms in conjunction with any other contraceptive method.

We used bivariate variables to identify the correlates of combined use, employing multiple logistic regression analyses to define independent predictors of combined use. We tested the following potential correlates of condom use: demographic characteristics (age, race, education, marital status, employment and residence in subsidized housing); sexual history variables (age at first intercourse, pregnancy history, STD history and history of HIV testing); attitudinal variables (attitudes toward safer sex, the perceived risk of STD and HIV, belief in condom efficacy [dichotomized as very effective versus somewhat or not effective], and concern about acquiring HIV or an STD); behavioral risk factors* (having any risk factor, having a partner with any risk factor, the type of the most recent sexual relationship—primary, new or casual, having had three or more sexual partners in the previous year, duration of the relationship with the primary partner, and alcohol or drug use at last intercourse); and having taken protective measures to avoid an STD (refusing sex unless a condom was used, refusing sex out of fear of getting an STD, and asking a partner about an STD).

To compare attitudes toward HIV risk reduction in the two communities, we derived a score from five questions in the survey using the 4-point Likert scale from (1) strongly disagree to (4) strongly agree, encompassing a range of 5–20 points. These items assessed individual and community attitudes toward HIV prevention behaviors, such as having sex less often to prevent HIV transmission, knowing how condom use affects sexual activity and obtaining condoms in the community. The measure of internal consistency showed an acceptable level of reliability (Cronbach's alpha=0.60).

Table 2. Percentage of women who used a contraceptive method or methods at most recent intercourse, by age-group (N=717)

Method	All (N=717)	17–19 (N=302)	20–24 (N=220)	25–29 (N=127)	30–35 (N=68)
Pill	40.1	53.1	35.5	29.9	17.7
Condom	33.2	41.3	29.6	26.0	22.1
Implant*	7.8	4.7	12.5	12.0	2.2
Other methods	18.5	13.8	19.4	27.2	20.0
Diaphragm	6.1	†	†	†	†
IUD	4.9	†	†	†	†
Sponge	4.2	†	†	†	†
Spermicide	3.1	†	†	†	†
Condom with any other method	17.4	24.1	12.7	15.0	7.4
Condom with pill‡	38.1	41.6	32.1	36.8	33.3
Condom with any method but pill§	10.7	14.3	6.4	13.5	7.1
None	24.5	15.9	26.4	29.9	47.1

Note: Multiple responses allowed. *Based on 435 respondents in 1992 survey only. †Cells too small to calculate reliable results. ‡Denominator is pill users only. §Denominator excludes pill users and users of condom alone.

Results

The surveys conducted in the two communities prior to the intervention activities demonstrated considerable community concern and mobilization about HIV and STDs.[14] Respondents demonstrated high levels of knowledge about HIV transmission and nearly half (49%) reported that they had made personal behavioral changes since learning about AIDS. Over 80% of respondents reported they could do "a lot" to prevent becoming infected with HIV.

Table 1 provides some demographic characteristics of the 775 sexually active women who completed the face-to-face interview for whom complete demographic data were available. The age distribution of the sample reflects our sampling design, but is skewed toward younger ages since we excluded sterilized women, who tend to be older, from this analysis. The sample was predominantly black, reflecting the racial composition of the two communities. Two-thirds of the full sample reported having completed at least a high school edu-

*Respondents were considered to have a personal risk factor for HIV transmission if they reported one or more of the following: more than two sexual partners in the past year, injection drug use in the past year, ever having been in drug treatment, having been treated for an STD in the past year, or having exchanged sex for money or drugs in the past year. Partner risk for HIV transmission was defined as having had a sexual partner in the past six months with at least one of the following: STD infection, HIV infection, or a history of injection drug use, bisexual behavior or having been with a prostitute.

Table 3. Odds ratios (and 95% confidence intervals) of the likelihood of using a condom in addition to another method at most recent intercourse, by age-group and other methods used

Method	All women	17–19	20–24	25–29	30–35
Pill	1.43 (1.05–1.90)	1.03 (0.65–1.6)	1.20 (0.66–2.19)	2.15 (0.94–4.94)	2.05 (0.52–8.00)
Implant	0.35 (0.14–0.87)	0.56 (0.14–2.3)	0.28 (0.06–1.32)	0.31 (0.04–2.64)	*
Spermicide	3.01 (1.27–7.15)	*	*	*	*
Other	0.21 (0.13–0.36)	0.22 (0.10–0.5)	0.11 (0.03–0.38)	0.36 (0.12–1.01)	0.51 (0.10–2.52)
Diaphragm	0.19 (0.07–0.53)	*	*	*	*
IUD	0.32 (0.12–0.84)	*	*	*	*
Sponge	0.14 (0.03–0.58)	*	*	*	*

*Cells too small to calculate reliable results.

cation. Only 45% were currently employed and 40% lived in subsidized housing.

Nearly one-quarter (24%) of all women reported at least one personal risk factor for HIV in the previous year (not shown). Further, 10% reported that their partners had engaged in high-risk behaviors in the previous six months. Personal risk factors and partner risk factors were correlated (odds ratio of 5.1, 95% confidence interval of 2.9–8.9). Among adolescents, 28% reported one or more personal risk factors for HIV, and 11% reported risk factors for their main partner.

Table 2 (page 75) lists the contraceptive method or methods that respondents used the last time they had intercourse. Overall, the pill was the most prevalent method, used by 40% of the sample, followed by the condom (33%), the levonorgestrel implant (8%), the diaphragm (6%), the IUD (5%), the sponge (4%) and spermicides (3%). One-quarter of women reported they used no method. Pill and condom use each declined with age. Reliance on the levonorgestrel implant (recorded for 1992 only) was highest among women in their 20's. Age-specific rates for the less common methods are unreliable because of small numbers.

As Table 2 shows, 17% of the sample reported combined method use—38% of pill users also used a condom, and 11% of users of methods other than the pill did so. Combined use was highest among 17–19-year-olds and among pill users; most combined use represents the use of condoms with the pill or with a spermicide. Twenty-four percent of 17–19-year-olds but only 7% of women aged 30–35 reported condom use in conjunction with another method.

As Table 3 shows, condom and pill use were positively associated in the full sample (odds ratio of 1.43). For adult women (aged 20–35), condom use was positively associated with pill use (odds ratio of 1.57, p=.052, not shown) and with spermicide use (odds ratio of 3.01, 95% confidence interval of 1.27–7.15, not shown). For adolescents, there was no significant association between condom use and pill use.

Condom use was negatively associated with the use of all other methods except spermicides. The strongest negative associations were between condom and diaphragm use (odds ratio of 0.19) and between condom and sponge use (odds ratio of 0.14). Condom use was also negatively associated with use of the levonorgestrel implant (odds ratio of 0.35) and of the IUD (odds ratio of 0.32). There were few significant associations by individual age-groups between condom use and use of another method.

Table 4 lists the reasons given by respondents for using a method the last time they had intercourse. In general, for those methods that potentially protect against both pregnancy and STDs (i.e., the condom, the diaphragm, the sponge and spermicides), many women reported using these methods for such double protection. For methods that provide no protection against STDs (i.e., the pill, the levonorgestrel implant and the IUD) virtually no one reported their use for this reason.

In bivariate analyses, combined method use was positively correlated with a variety of factors, these include being younger, being older than 15 at first intercourse, having ever been pregnant, holding more positive attitudes toward safer sex, having a greater belief in condom efficacy, never having been tested for HIV, and ever having refused to have sex because no condom was available. Other factors, including personal and partner risk factors, were not associated with combined use.

Table 4. Percentage distribution of methods used by women at last intercourse, by reason for use

Method	N	Pregnancy prevention	STD prevention	Both reasons	Total
Condom	228	13	22	65	100
Pill	286	98	0	2	100
Implant	33	100	0	0	100
Diaphragm	43	53	0	47	100
IUD	35	100	0	0	100
Sponge	30	37	0	63	100
Spermicide	21	29	19	52	100

According to results of the logistic regression analysis that compared women using nonbarrier methods only and women who combined condoms with a nonbarrier method, those factors that significantly predicted combined use included holding positive attitudes toward safer sex, ever having refused sex because no condom was available and greater belief in condom efficacy (see Table 5). Ever having been tested for HIV was negatively related to combined use. Indices of personal and partner risk for HIV and other STDs, demographic characteristics and background factors were not associated with combined use.

Discussion and Conclusions

We found considerable combined method use in this sample of inner-city, Baltimore women. Over one-third of pill users reported using condoms as well. Combined use was highest among adolescents, although the association between condom and pill use was strongest among women aged 20–35. Very little of combined use involved methods other than the pill, except for a small group who reported using spermicides with condoms. Reported intentions to prevent STDs and pregnancy reflected a realistic understanding of the efficacy of various methods in doing so.

The most striking finding was the variation in condom use with other contraceptive methods. Condom use was positively associated with use of the pill and spermicides, but was negatively associated with the use of other contraceptive methods. The strongest negative associations were between condom use and the diaphragm and the sponge, both of which already provide some protection against STDs. However, condom use was also negatively associated with use of the levonorgestrel implant and the IUD, neither of which prevents STD transmission. This finding suggests that women who choose passive, noncoital methods may be uncomfortable communicating with their partners or that their partners are unsupportive; both these situations would impede the use of condoms among couples who might be protected from pregnancy but not from the risk of STD transmission.

The positive association between use of the pill and the condom may reflect a variety of factors, including the personal characteristics of women who choose the pill. Such women are younger than the users of other methods, and may be more

highly motivated to avoid STDs (including HIV) and more willing to adopt new behaviors such as combined use. Pill use requires a daily effort; this deliberate action may be associated with a greater belief in one's ability to insist on condom use. Women who choose the pill, or their partners, may also be different from women who choose passive contraceptive methods and these differences may directly relate to the probability of condom use.

In a 1990 survey conducted in these two communities, respondents reported receiving family planning services from a wide variety of providers—public and private clinics, hospitals and private doctor's offices.[15] Enormous changes in the attitudes of family planning providers toward condom use have occurred over the past 10 years. Most family planning clinics today actively distribute condoms and endorse their use. The data from the current study indirectly suggest that the frequent reproductive health counseling offered by providers may influence condom use and combined use among pill users, whose method requires repeated visits to renew supplies. On the other hand, users of methods such as sterilization, the levonorgestrel implant, the IUD, the diaphragm and the sponge do not have as frequent contact with their family planning providers.

This potential explanation for why pill users are most likely to combine use with a condom requires further exploration; if true, it has clear implications for newer methods such as the levonorgestrel implant, which requires only limited contact with the provider, and for efforts to make the pill available without prescription.[16] By 1992, the levonorgestrel implant, which was introduced in the United States at the end of 1990, had become the third most commonly used reversible method in these Baltimore communities. The patterns of condom use among levonorgestrel implant users mirrored those among users of other long-term methods such as the IUD and sterilization. Research suggests that many women select the levonorgestrel implant because they have had difficulties using other methods, including the pill and condoms.[17] As such, condom use may remain difficult for this group of women.

The most important predictors of combined use were holding positive attitudes toward safer sex, believing strongly in the efficacy of condoms, and reporting a self-protective action (i.e., ever having refused sex if condoms were unavailable). These findings are consistent with psychosocial theories of health behavior (e.g. the Theory of Reasoned Action) and prior research on the predictors of condom use that have stressed self-efficacy, positive attitudes toward condoms, peer support, belief in method efficacy, and perceived risks and benefits surrounding condom use.[18] The negative association between combined method use and HIV testing may reflect decisions to forgo condom use after finding out one's HIV-status. Rates of HIV testing rose dramatically in these communities in the early 1990s, from 25% of women we surveyed in 1990, to 47% in 1991, to 65% by 1992; these increases were strongly related to efforts to test pregnant women for HIV.[19]

Disturbingly, the presence of personal and partner behavioral risk factors for STDs and HIV did not predict combined method use. Other studies have similarly suggested that individuals with the highest risk—those with the greatest number of sexual partners—may be the least likely to practice safer sex.[20] Programs should target condom promotion and skills training to these women, and their partners, whose behavior places them at risk.

Previous contraceptive and fertility studies have not recorded combined method use because they have focused on pregnancy prevention and recorded the prevalence of the most effective methods to prevent pregnancy.[21] Future national demographic surveys need to document STD and HIV prevention behavior in addition to contraceptive behavior. Qualitative research is needed to elucidate the decision-making process regarding these twin goals.

Several important limitations to this study must be noted. First, women may be more likely to report condom use in the context of a survey on HIV risk such as ours. Second, street surveys are more likely to interview people who spend more time on the street, and these individuals may be at greater risk for HIV and STD transmission than those in the general population. We conducted telephone and street surveys simultaneously in these communities in 1990 and 1993 as part of a larger evaluation of a perinatal HIV prevention project. We found similar levels of sexual behaviors using these two types of survey methods, but respondents in the street sample reported higher levels of drug use than did those contacted by telephone.[22] Reported levels of condom use were similar using the two survey methods.

Another limitation is the lack of information about where and how these women learned about HIV, although we know that their knowledge about HIV was very high. Many women had received HIV counseling and testing from a variety of public and private providers, although testing was negatively related to combined use. On the other hand, few women reported attending STD clinics or drug treatment centers, two other possible sources of HIV information.

Moreover, the results of our study cannot be directly generalized to other cities or communities. Baltimore has high rates of STDs and HIV, as well as a variety of innovative clinic and community-based prevention efforts and, as a result, combined method use may be higher in Baltimore than in other cities.

We were surprised and pleased at the rates of combined use reported in our study. These data suggest that the promotion of condoms to couples who are using other contraceptive methods is feasible. Family planning clinicians should continue to reinforce messages about the use of condoms for disease prevention, even when effective contraception is being used. Community-based efforts should be directed particularly to men and women with risk factors, and to communities that have high rates of STD and HIV infection.

Table 5. Odds ratios (and 95% confidence intervals) from the logistic regression analysis indicating the likelihood that women using a nonbarrier method also used a condom at last intercourse, by variable (N=353)

Variable	Odds ratio	95% C.I.	Parameter estimate
Positive attitudes toward safer sex	1.39	1.25–1.55	0.331
Ever refused to have sex without a condom	7.09	3.88–12.92	1.958
Ever tested for HIV	0.53	0.31–0.90	–0.634
Believes condom to be very effective	1.89	1.08–3.29	0.635
Intercept	*0.001*	*0.00–0.01*	*–6.508*

Note: All variables are dichotomous, except attitudes toward safer sex, which were measured on a 20-point Likert scale (5–20).

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