Two-Stage Cervical Cancer Testing: More Women Can Be Screened, and Fewer Undergo Unnecessary Treatment

Use of relatively expensive tests for cervical cancer only after abnormalities have been identified through lower-cost procedures fails to identify some women with disease but allows many more women in resource-poor areas to be screened. Moreover, according to a study conducted among women living in a poor community outside of Cape Town, South Africa, women who receive human papillomavirus (HPV) testing, cervicography or a Pap smear only if visual inspection of the cervix identifies cervical disease are less likely to undergo unnecessary treatment than are women who are initially screened using one of those tests.[1]

In January 1996, flyers and radio advertisements were used to recruit and enroll 1,423 women aged 35–65 from a settlement outside of Cape Town. Participants were referred to an outpatient clinic, where they received a gynecologic examination from a health worker specially trained in screening techniques. Each examination consisted of the same sequence of screening methods: a Pap smear, an HPV deoxyribonucleic acid (DNA) test,* direct visual examination of the cervix and cervicography (a photograph of the cer-vix). All women were asked to return to the clinic in 2–6 days to obtain their results.

Women with a positive visual exam or a highly positive HPV DNA assay (levels at least 10 times the control value) underwent colposcopy when they returned to the clinic. All low-grade lesions were biopsied; high-grade lesions were treated by loop electrosurgical excision. Endocervical curettage was performed if no lesion was evident.

Results from Pap smears and cervicography were not available for several weeks. Any woman whose results from those tests indicated low- or high-grade lesions or cervical cancer but who had not had a colposcopy as a result of HPV testing or direct visual inspection was recalled for colposcopy and any necessary treatment.

Among women found to have high-grade lesions or cancer according to cervical biopsy, endocervical curettage or loop excision, the researchers calculated the proportion who had positive results on a given test; they also calculated the proportion of women with negative pathological findings or negative results on all four screening tests who had positive results on a given test. The results of the individual screening tests were then used to estimate values for two-stage screening procedures in which women who had positive results from direct visual inspection would receive a Pap smear, an HPV DNA test or cervicography.

A total of 1,335 women (94%) had complete screening data; their median age was 39, and 16% were aged 50 or older. Thirty-two percent of the women screened were identified by one of the four screening tests as having a cervical abnormality; of these, 84% (363) subsequently had a colposcopy. After adjusting for loss to follow-up, the researchers found that 5% of all women screened had low-grade lesions, 3% had high-grade lesions and fewer than 1% were diagnosed with cancer.

Direct visual inspection of the cervix and Pap smears each identified 30 of the 37 women confirmed through cervical biopsy as having either cancer or a high-grade lesion. These screening procedures also produced positive findings for, respectively, 228 and 73 women who were later determined to be disease free (a false-positive result). Highly positive HPV DNA test results correctly identified 18 women with cancer or high-grade lesions and produced 46 false-positive results. Use of the standard HPV DNA testing criterion (any level higher than the positive control value) found 27 of the women with disease, but produced positive results for 166 disease-free women. Cervicography accurately identified 26 women with cancer or high-grade lesions and gave positive results for 116 disease-free women.

Two-stage screening using direct visual inspection of the cervix in combination with either a Pap smear or cervicography would have accurately identified 23 of the 37 women who had cancer or high-grade lesions, while direct cervical inspection followed by HPV DNA testing would have correctly identified 21 women as requiring treatment. These two-stage screenings would have resulted in 28, 52 and 78 false-positive findings, respectively.

After adjustment for loss to follow-up, the proportion of women with cervical disease identified by individual methods ranged from 71% for cervicography to 82% for Pap smears. The HPV DNA test using the standard cutoff level identified 72% of such women; use of the higher cutoff level identified only 47%. With the exception of screening using the more restrictive HPV DNA test, all two-stage procedures identified a lower percentage of women needing treatment than did any of the individual methods: Providing a Pap smear or cervicography only after positive results from visual inspection of the cervix identified 58% of women with cancer or high-grade lesions, while using HPV DNA testing (based on the higher cutoff level) after visual inspection identified 51%.

The proportion of disease-free women with positive results on individual screening methods ranged from 6% for HPV DNA testing using the higher cutoff level to 19% for direct visual inspection. Overall, the two-stage screening procedures were less likely than tests used in isolation to result in false-positive results: The proportion of disease-free women with positive results on two-stage procedures was 2% for direct cervical observation combined with Pap smears, 4% for visual inspection of the cervix combined with HPV DNA testing and 6% for visual inspection combined with cervicography.

For every 1,000 women screened, direct visual inspection and Pap smears—the two most sensitive single tests—would accurately identify 24 women and 26 women, respectively, in need of treatment.

*Testing was conducted only for HPV types associated with a high risk of cancer. Results were evaluated using two cutoff levels, the standard criterion of any DNA level higher than the positive control value and a more restrictive criterion of at least 10 times the positive control value.

A two-stage procedure entailing direct visual inspection followed by a Pap test or cervicography would correctly identify 18 women per 1,000 screened, while following cervical inspection with an HPV DNA test would correctly identify 16 women needing treatment.

If all women whose initial screening with any of the four individual techniques produced abnormal results were referred for colposcopy, 206 women per 1,000 screened would undergo the procedure, 182 of them unnecessarily. Based on Pap smear results following direct visual inspection, 40 women per 1,000 would have a colposcopy, 22 of them unnecessarily; those figures would be 60 and 41 for direct visual inspection followed by HPV DNA screening, and 80 and 62 for visual inspection followed by cervicography.

The authors estimated that if resources limited use of Pap smears to 1,000 women, reliance on that test alone in a population similar to the one in their study would correctly identify 26 cases of cervical disease among every 1,000 women screened. In comparison, reliance on a two-stage procedure would mean that 4,854 women could obtain initial screening using direct visual inspection, of whom 1,000 would have abnormal results. These women would receive Pap smears, which would identify 89 as having high-grade lesions or cervical cancer. Thus, initial use of direct visual inspection would allow screening of almost five times as many women, and the same number of Pap smears would identify more than three times as many in need of treatment.

The investigators acknowledge that use of a two-stage screening procedure rather than traditional one-stage screening would result in a smaller proportion of women with cervical disease being identified. They argue, however, that in communities with limited resources, the use of a relatively expensive screening procedure only when abnormalities have been identified by a relatively inexpensive method affords a greater number of women access to cervical cancer screening. Moreover, by reducing substantially the number of women who unnecessarily undergo treatment, two-stage screening limits women's exposure to adverse health outcomes such as cervical narrowing, hemorrhage, infection and risk of infection with or shedding of HIV.—*K. Mahler*

Reference

1. Denny L et al., Two-stage cervical cancer screening: an alternative for resource-poor settings, *American Journal of Obstetrics and Gynecology*, 2000, 183(2):383–388.

Men Who Have Many Sexual Partners Before Marriage Are More Likely to Engage in Extramarital Intercourse

Men's premarital sexual behaviors are linked to the likelihood that they will have extramarital intercourse, but those relationships vary across countries. According to an analysis of data from four countries, the odds of extramarital sex increase significantly with the number of premarital partners in Tanzania and Thailand, and decline with rising age at sexual debut in Tanzania and Côte d'Ivoire.[1] Knowing the first partner for more than a day before having sex significantly decreases the odds of having extramarital sex in Côte d'Ivoire, but increases them in Tanzania. In Zambia, no premarital sexual behaviors analyzed are associated with extramarital sex.

In 1989 and 1990, the Global Programme on AIDS conducted partner relations surveys in nationally representative samples of men and women in Côte d'Ivoire, Tanzania and Thailand and from a sample in Lusaka, the capital of Zambia. All respondents participated in face-to-face interviews that included questions about premarital and extramarital sexual experience, current living arrangements, and social and demographic characteristics.

Women were omitted from the analysis because of their low prevalence of extramarital intercourse. After exclusion of men who had been married or in regular partnerships for less than a year, the final samples included 1,028 men in Côte d'Ivoire, 1,085 in Tanzania, 649 in Lusaka and 683 in Thailand.

The proportion of men reporting that they had had extramarital sex in the past year ranged from 16% in Thailand to 24–25% in Tanzania and Lusaka and 34% in Côte d'Ivoire. There was similar diversity in reports of premarital sexual experience. Around 20% of men in Côte d'Ivoire and Lusaka said they had first had intercourse before age 15, compared with 9% of Tanzanian and 4% of Thai respondents. The proportion who reported that their first intercourse was with a partner they had known for one day or less (an indication of casual or paid sex) was highest in Thailand, where prostitution is common—35%, in contrast to fewer than 20% in the African countries. The median number of premarital partners was three in Thailand and Lusaka, two in Tanzania and zero in Côte d'Ivoire.* Responses to two items were similar in the four locales: Between 30% and 40% of men were married within a year of first intercourse, and 30–45% married their first partner.

A bivariate analysis identified five predictive factors associated with extramarital sex—age at first intercourse, length of acquaintance with the first partner before intercourse, time between sexual debut and marriage, whether men married their first partner and number of premarital partners. All but two of these variables were entered into a multivariate logistic regression analysis, along with age and other potentially confounding behavioral, social and demographic variables. The exceptions—time between first intercourse and marriage and whether the man married his first partner—were omitted because they were strongly correlated with the number of premarital partners.

At all four sites, men who first had intercourse when they were 20 or older were less likely to have had extramarital intercourse in the previous year than were those who first had intercourse when they were younger than 15; however, the association was significant only for Côte d'Ivoire (odds ratio of 0.21) and Tanzania (0.38). Extramarital intercourse was significantly associated with short acquaintance with the first partner in Côte d'Ivoire (odds ratio of 0.51), and with longer acquaintance in Tanzania (1.55). While the odds of extramarital intercourse rose with the number of premarital partners in all sites, the association was significant only in Tanzania and Thailand: Compared with men who had had no premarital partners, the odds of extramarital sex among those who had had five or more such partners were 4.1 and 4.6, respectively.

Among the social and demographic factors, secondary or higher education and living in a nonmarital partnership were associated with higher odds of having had extramarital intercourse among men in Côte d'Ivoire (odds ratios of 1.9 and 2.9, respectively). In Tanzania, the odds of extramarital sex were decreased for rural men (0.67) and elevated for those in polygamous marriages (1.7).

*More than half of the valid responses in Côte d'Ivoire were from men who had had no premarital partners.

Pointing out that their findings are in line with results from Europe and the United States, the investigators suggest that "early sexual initiation and multiple premarital partners may establish a pattern of sexual conduct that persists into later sexual lifestyle patterns."—*M.L. O'Connor*

Reference

1. White R, Cleland J and Caraël M, Links between premarital sexual behaviour and extramarital intercourse: a multi-site analysis, *AIDS*, 2000, 14(15):2323–2331.

Personalized HIV Counseling And Testing Show Promise In Reducing Risk Behaviors

Men and women in developing countries who are offered personalized voluntary HIV counseling and testing are likely to avail themselves of those services, and they subsequently reduce their practice of risky behaviors more than their peers who receive HIV education in a group setting, according to findings from a multicenter study.[1] The proportion of participants who had unprotected intercourse with someone other than a primary partner dropped by about 35–39% among men and women receiving individualized services, but by only 17% among those receiving group education; patterns of behavior change differed by participants' HIV infection status. A related analysis demonstrates that voluntary counseling and testing is highly cost-effective, particularly when offered to couples and to HIV-infected people.[2] Together, these studies bolster the case for personalized HIV prevention services in developing countries, a strategy that has been opposed because of questions about cost, logistics, and whether people are motivated to learn their HIV status and to modify their behavior.

Effectiveness

The effectiveness study was conducted at clinics in Kenya, Tanzania and Trinidad in 1995–1998, and was open to men and women who were at least 18 years old and were not known to be infected with HIV. (The prevalence of infection is estimated at 8–13% in Kenya, 10–12% in Tanzania and 1–2% in Trinidad.) Participants could enroll individually or with a partner, although members of enrolled couples were interviewed individually. In all, 3,120 individuals and 586 couples enrolled. On average, participants were in their late 20s or (in the case of men enrolled as part of a couple) early 30s, and the majority had had at least a primary education. Participants who enrolled as individuals were predominantly unmarried, whereas about two-thirds of couples were married.

Upon enrollment, participants completed a baseline survey that asked about their sexual behavior in the previous two months. Their last five partners were all categorized by type: For men and women enrolled individually, partners were classified as primary (spouses, boyfriends and girlfriends) or nonprimary. For participants enrolled as part of a couple, the partner who was also in the study was distinguished from all other partners.

Participants were randomly assigned to receive either personalized counseling and testing or a group education intervention. (Half of participants were assigned to each intervention, and the two groups had similar background profiles.) Personalized counseling included risk assessment and the development of a risk reduction plan, tailored to participants' needs. Those receiving this intervention were offered HIV testing and, if they agreed to be tested, were asked to return for the results two weeks later. By contrast, men and women in the group education intervention watched a 15-minute video and participated in a discussion about HIV transmission and condom use. All participants were given 25 condoms and a brochure illustrating how to use them, and were invited to return for more condoms at any time.

At an initial follow-up visit (which occurred an average of 7.3 months after randomization), participants were interviewed about their sexual behavior in the previous two months and were tested (and, if necessary, treated) for sexually transmitted diseases (STDs). All participants who had had an HIV test were offered a retest, and those in the group intervention were offered personalized counseling and testing. At a second follow-up visit (occurring, on average, 13.9 months after randomization), participants were reinterviewed and were offered an HIV retest.

Virtually all participants who received personalized services agreed to take an HIV test, and most (roughly 60–90% of both men and women) returned to get their results. Furthermore, most of those who made a follow-up visit chose to be retested at that time. Similarly, the vast majority of participants in the group intervention opted for HIV testing when they made their first follow-up visit, and most of these (about 70–90%) returned for the results. In both groups, the rate of testing dropped at the second follow-up.

In the baseline interview, 31% of men who enrolled as individuals in the counseling and testing intervention reported that they had recently had unprotected sex with a nonprimary partner; by the first follow-up visit, the proportion had fallen to 20% (a 35% decline, which was statistically significant). Among men in the group intervention, by contrast, the proportion reporting this behavior did not change. Women in both interventions reported a significant decrease in the likelihood of having unprotected sex with a nonprimary partner, but the change was larger among those who had received personalized services—a 39% drop, from 23% to 14%—than among those in the group intervention—a 17% reduction, from 24% to 20%. For both men and women, further reductions occurred between the first and second follow-up visits.

Among participants enrolled as part of a couple, rates of unprotected intercourse with a partner other than the one in the study did not change between the baseline and follow-up visits for either intervention group. However, unprotected sex with the partner in the study declined significantly over time; again, participants in the counseling and testing intervention reported greater declines (24% for men and 21% for women) than did those who received group education (15% and 18%, respectively).

Data on STDs acquired between baseline and the first follow-up visit were available for 89% of participants enrolled as individuals and for 85% of those enrolled as members of couples. By applying logistic regression techniques to these data, the investigators calculated that individuals who had had unprotected intercourse with a nonprimary partner were twice as likely to have contracted an STD as were those who had not engaged in this behavior (odds ratio, 2.2). In addition, women who had had unprotected sex with a primary partner had an elevated STD risk (1.9). For couples, unprotected sex with a partner not in the study tripled the risk of STD infection (3.0).

A final set of calculations revealed that for men who received personalized services, the proportions reporting unprotected intercourse with primary and nonprimary partners at the first follow-up visit were lower among those who had tested positive for HIV when they entered the study than among those who had not been infected. For women, however, an HIV diagnosis was associated with a reduction in intercourse with primary partners only. Couples in which one or both

members had tested positive for HIV at baseline were significantly less likely to have engaged in unprotected intercourse than were couples in which neither member had been infected. HIV-infected individuals and participants who had unprotected sex with a nonprimary partner had elevated odds of STD infection at the first follow-up (odds ratios, 3.2 and 2.7, respectively).

Cost-Effectiveness

Using results of the effectiveness study and cost information supplied by the clinics, the researchers assessed the cost-effectiveness of providing voluntary HIV counseling and testing in Kenya and Tanzania. (Trinidad was excluded from this analysis because it differs greatly from the African countries in terms of HIV prevalence and economic factors.) They estimated that for every 10,000 men and women obtaining personalized services, 1,104 infections would be prevented in Kenya and 895 would be averted in Tanzania during the following year. Costs per infection averted would total US$249 and $346, respectively; the investigators point out that the costs of treating an infected individual, "not to mention the noneconomic costs in suffering and social impact on families and communities," would likely be substantially higher.

The researchers also estimated the costs of counseling and testing per disability-adjusted (i.e., fully productive, healthy) life-year saved. These costs would average $12.77 in Kenya and $17.78 in Tanzania (totals that compare favorably with those of other public health interventions); they would be lowest for men and women who enrolled in the intervention with a partner and for HIV-infected persons. Under alternative assumptions about HIV prevalence and program costs and effectiveness, the total estimated cost per healthy life-year saved ranged from $5.16 to $27.36 in Kenya and from $6.58 to $45.03 in Tanzania. According to the investigators, $50 is a recommended threshold for this measure in developing countries; therefore, under even the costliest scenario in Tanzania, the intervention is cost-effective.

Conclusion

Although voluntary HIV counseling and testing has not been widely accepted in developing regions, the researchers urge that it become "part of a standard package of prevention strategies." Echoing this recommendation, the author of a commentary on these studies writes: "The challenge is no longer the need to show the efficacy of [counseling and testing] but to make it accessible to those who desperately need it and to expand it and render it more acceptable, innocuous, and less expensive."[3]—*D. Hollander*

References

1. The Voluntary HIV-1 Counseling and Testing Efficacy Study Group, Efficacy of HIV-1 counselling and testing in individuals and couples in Kenya, Tanzania, and Trinidad: a randomised trial, *Lancet,* 2000, 356(9224): 103–112.

2. Sweat M et al., Cost-effectiveness of voluntary HIV-1 counselling and testing in reducing sexual transmission of HIV-1 in Kenya and Tanzania, *Lancet,* 2000, 356(9224):113–121.

3. Van de Perre P, HIV voluntary counselling and testing in community health services, commentary, *Lancet,* 2000, 356(9224):86–87.

Indian Women Often Select Methods Other Than Those Their Providers Recommend

In India, women's contraceptive choices frequently differ from the recommendations of their health care providers.[1] Of more than 8,000 women who received explanations of all methods available through the government family planning program, 59% requested the IUD, while health care providers recommended the method for 33%. Providers advised 36% of women to adopt the hormonal implant, yet only 6% of women preferred it. Fifteen percent of women requested tubal sterilization and 8% selected condoms, but providers recommended those methods for 19% and 3% of women, respectively. Nevertheless, more than 90% of the women ultimately obtained their method of choice.

To determine the relative acceptability of the available methods—the implant, the Copper T 200 IUD, combined oral contraceptive pills, condoms, vasectomy and tubal sterilization—investigators recruited 22,178 women who sought contraceptive services at one of 10 research centers at medical colleges around the country during the one-year study period. Of these women, 64% had already decided on a contraceptive method and did not receive further counseling.

The remaining 8,077 women discussed all of the available methods with their health care provider, including each method's benefits and liabilities. All information was presented in the patient's own language and in simple terms to ensure comprehension. In addition to verbal explanations, the staff provided pamphlets and brochures and exhibited the contraceptive devices. The presentations lasted an average of 10 minutes. The women then made their own choice.

All women were screened to rule out any contraindications to their chosen contraceptive, and, if necessary, they were counseled about a more appropriate option. Data were gathered on demographic characteristics, obstetric history and choice of contraceptive.

Women's initial choices frequently differed from their health care provider's recommendations for them. Overall, 59% wanted the IUD, 15% tubal sterilization, 8% condoms, 6% oral contraceptives, 6% the implant and 1% vasectomy; 5% preferred not to use a method. Health care providers, in contrast, recommended the implant for 36%, the IUD for 33%, tubal sterilization for 19%, oral contraceptives for 3%, condoms for 3% and vasectomy for 2%; they suggested that 3% of women use no method.

In total, 61% of the women received an IUD, with smaller proportions adopting tubal sterilization (16%), condoms (9%), oral contraceptives (5%), the implant (5%), other methods (1%) or no method (3%). More than 90% of the women received their method of choice—from 85% of those who wanted to be sterilized to 92% of those who preferred the IUD or the implant. Contraindications were the main reason cited when women did not receive the method they preferred.

To better understand women's contraceptive choices, the investigators examined their demographic and reproductive characteristics. Women were most likely to seek contraceptive services following a medical termination of pregnancy (50%) or in the interval between pregnancies (43%); small proportions adopted a method during the postpartum period or following a cesarean section. Women adopting a method following a medical termination or in the interval between pregnancies were most likely to choose the IUD (65% and 58%, respectively), while those seeking contraception following a cesarean section were most likely to prefer tubal sterilization (62%).

As might be expected, the proportion of women requesting permanent methods of contraception increased with age and family size and the proportion selecting spacing methods decreased. For example, as family size rose from one child to four or more children, the proportion of women adopting tubal sterilization climbed from 2% to 63%, while the proportion of women accepting the IUD fell

from 75% to 21%. Women who chose spacing methods were 25–26 years old, on average, while those who adopted female sterilization were about 29 years old.

Women's area of residence (categorized as rural, urban or urban slum) did not reliably predict their choice of a contraceptive method. However, women who chose sterilization were more likely to live in rural areas (27%) than in urban areas (16%) or in urban slums (14%), and women who selected the contraceptive implant were slightly more likely to live in urban areas (6%) than in rural areas (3%) or in urban slums (2%).

Uneducated women were more likely than women with any level of schooling to select female sterilization (25% vs. 11–19%), possibly because uneducated women tended to have larger families. At all educational levels, women were increasingly likely to choose sterilization as family size increased. The proportion adopting sterilization ranged from less than 1% among women with more than a high school education and only one child to 73% among illiterate women with four or more children.

The investigators note that the great majority of the women in this study were able to make an informed contraceptive choice after receiving balanced information about their options. In addition, they point out, differences of opinion with the health care provider did not deter the women from selecting the contraceptive method that they felt best suited their particular needs. The investigators conclude that there is an urgent need for "a reorientation training program that makes available appropriate teaching and mass media materials both to family planning providers and potential clients to promote the concept and practice of informed choice in the national program."—*L.J. Ninger*

Reference

1. Baveja R et al., Evaluating contraceptive choice through the method-mix approach: an Indian Council of Medical Research (ICMR) Task Force study, *Contraception*, 2000, 61(2):113–119.

Peer Counselors' Support Is Successful in Promoting Exclusive Breastfeeding Among Bangladeshi Women

A program in Dhaka, Bangladesh, in which pregnant and postpartum women receive home visits from specially trained peer breastfeeding counselors has been highly effective in encouraging women to feed their infants only breast milk for the first five months, in accordance with national health policy recommendations.[1] In a case-control study assessing the program's effectiveness, counseled women began breastfeeding sooner than similar women who did not receive counseling, and a higher proportion of them exclusively breastfed throughout the first five months of their infant's life. At five months, 70% of counseled women, compared with 6% of controls, were feeding their infants only breast milk.

The peer counseling intervention was designed to promote breastfeeding among women who give birth at home and thus may not otherwise receive correct information about breastfeeding. Counselors were local women with at least four years of schooling who had breastfed their own children. Once trained, they made a total of 15 visits to each woman in the program: two in the last trimester of pregnancy, three during the first two weeks postpartum and then one every two weeks until the infant was five months old. During the prenatal visits, counselors explained the benefits of exclusive breastfeeding, encouraged women to hold their infants soon after delivery and to begin breastfeeding within an hour, and advised women about their own dietary needs. In subsequent visits, they addressed any problems the women were having with breastfeeding and continued to encourage exclusive breastfeeding.

Study participants were identified through a house-to-house survey conducted in 1996. Women were eligible if they were 16–35 years old, were in their last trimester of pregnancy, and had no more than three living children or had had no more than five births. In all, 726 women enrolled; half were assigned to receive the intervention, and the other half were designated as controls. Participants completed seven semistructured interviews exploring their breastfeeding status; additional interviews and focus groups were conducted with women in the counseling group to assess their views of the program.

Most women in both the counseling and the control groups were housewives, had had five or fewer years of schooling and had given birth before; on average, they were about 23 years old. Roughly four in 10 had received no prenatal care, and about two in 10 had made only one prenatal visit. While familiarity with breastfeeding was common, few women knew what "exclusive breastfeeding" means. All of the women intended to nurse.

Women in the counseling group held their infants sooner after delivering than did controls (one hour vs. two hours); they also began to breastfeed sooner (one hour vs. nine hours) and were more likely to start nursing in the first hour (64% vs. 15%). Only 31% of mothers who had received counseling gave their infants any food or fluids before feeding them colostrum (a breast secretion with high concentrations of proteins and antibodies that is produced shortly after childbirth), compared with 89% of controls. During the first four days after giving birth, a significantly higher proportion of women in the counseling group than of controls fed their infants only breast milk (56% vs. 3%); on the fourth day, a significantly higher proportion were exclusively breastfeeding (84% vs. 30%).

The proportion of women exclusively breastfeeding in each of the first five months after delivery was considerably higher among those who had received counseling than among controls; at the end of five months, 70% and 6%, respectively, were giving their infants only breast milk. Half of babies whose mothers received counseling were exclusively breastfed throughout their first five months.

During their final interview, 95% of women from the counseling group said that they had found the peer counselors' visits beneficial. While they considered the visits soon after delivery (which provided necessary practical help) the most useful, they stressed that all of the visits were important. The mothers valued not only the information they received from the counselors but also the encouragement and support.

Discussing their findings, the investigators note that although the study was conducted in an urban area with relatively good hospital and maternity services, 78% of women delivered at home. Therefore, they conclude that the program's demonstrated effectiveness in promoting breastfeeding "confirms the need for community-based breastfeeding promotion strategies in Bangladesh."—*D. Hollander*

Reference

1. Haider R et al., Effect of community-based peer counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a randomised controlled trial, *Lancet*, 2000, 356(9242):1643–1647.

Obstetric Complications Common in West Africa, Despite Accessible Care

Even when West African women have easy access to a maternity ward and essential obstetric care, many develop life-threatening complications of pregnancy, and the fatality rate associated with some complications can be quite high.[1] In a study conducted in cities and towns in six countries, 3–9 women of every 100 giving birth developed a severe complication that was directly related to the pregnancy. Roughly one-third of those with sepsis or uterine rupture, and about one-fifth of those with eclampsia, died.

The study examined the incidence of pregnancy-related morbidity in the capital cities of Burkina Faso, Côte d'Ivoire, Mali, Mauritania and Niger, and in two small towns and a major city in Senegal. Maternity wards with midwives and doctors on staff were accessible in each study area; all of the cities also afforded easy access to hospitals where women could be seen for obstetric complications. Pregnant women were identified between December 1994 and June 1996, and were asked to participate in four survey interviews: one each at enrollment, at 32–36 weeks' gestation (as measured by weeks since their last menstrual period), at delivery and 60 days later. Although some of the home visits included physical examinations, researchers explained to the women that these examinations were only for purposes of the study, and they encouraged participants to get regular medical care.

In all, 20,326 women (virtually all pregnant women in the study areas) participated. On average, they were 27 weeks pregnant and 26 years old when they enrolled; three in 10 women were in the age-groups generally considered at risk for obstetric complications (i.e., younger than 20 and 35 or older). Most were married, and about half were literate. Excluding the current pregnancy, participants had been pregnant an average of 2.7 times.

By 36 weeks' gestation, the women had had, on average, 2.2 prenatal consultations; 7% had received no prenatal care. The majority of participants (81%) gave birth at a health center; of these, 72% were assisted by midwives, 21% by trained traditional birth attendants, 3% by doctors, and the rest by untrained attendants or family members. Among women who delivered at home, only 5% were attended by midwives or doctors, and 24% were assisted by trained traditional birth attendants.

Some 1,215 women experienced severe obstetric complications, such as hemorrhage requiring a blood transfusion or hospitalization, dystocia (mainly obstructed or prolonged labor, but also uterine perforation), hypertensive disorders (eclampsia, preeclampsia and hypertension leading to hospitalization or death) and sepsis. The resulting severe maternal morbidity ratio was 6.2 life-threatening conditions per 100 live births; this ratio ranged from 3.0 per 100 in Mali to 9.1 per 100 in the Senegalese city included in the study. Socioeconomic variations did not explain differences among sites.

The most common life-threatening pregnancy complication was hemorrhage, which accounted for 46% of severe complications; more than half of hemorrhages occurred during the postpartum period. Dystocia was the second most frequent severe complication, representing 31% of severe maternal morbidity. Hypertensive disorders accounted for 10% of life-threatening complications; sepsis, for 1%; and a variety of other causes, for 12%.

Forty-one women—or one woman for every 32 severe complications—died of these conditions. Case fatality rates ranged widely by type of complication. Thirty-three percent of women who developed sepsis, 30% of those who had a ruptured uterus and 18% of those with eclampsia died. By contrast, the proportion among those who had a hemorrhage or another type of complication was 3%. Hemorrhage accounted for the largest number of deaths (17), and other complications accounted for 4–7 deaths each.

According to the researchers, the findings that many women delivering in health facilities are not attended by doctors or midwives and that certain complications carry high risks of death suggest a "significant malfunctioning of public health services" and "an unsatisfactory quality of maternal health care" in these six countries. By clarifying maternal health needs and identifying conditions that often lead to obstetric deaths, the investigators hope to have contributed to a better understanding of severe maternal morbidity and thus to efforts to reduce maternal and perinatal mortality in West Africa.—*D. Hollander*

Reference

1. Prual A et al., Severe maternal morbidity from direct obstetric causes in West Africa: incidence and case fatality rates, *Bulletin of the World Health Organization*, 2000, 78(5):593–599.