

## Risks of Adverse Obstetric and Perinatal Outcomes Increase with Severity of Female Genital Mutilation

Women who have undergone female genital mutilation have a higher risk for adverse obstetric outcomes than women who have not, and the risks seem to be greater with more severe mutilation, according to the first large-scale prospective study of the effects of female genital mutilation on maternal and neonatal outcomes.<sup>1</sup> Relative to women who have not undergone genital mutilation, those who have are more likely to have cesarean sections, heavy postpartum blood losses and extended hospital stays. The infants of women who have undergone female genital mutilation are more likely to require resuscitation at delivery and are at higher risk for inpatient perinatal death than are infants born to women who have not undergone genital mutilation.

Although more than 100 million women worldwide have undergone some form of genital mutilation, there is little information on obstetric outcomes in this population. The few investigations that have been conducted have had a small number of cases or methodological limitations. In the present study, researchers sought to identify associations between the severity of genital mutilation and outcomes for the women and their infants during and immediately after delivery.

Between March 2001 and November 2003, 28,393 women presenting for singleton delivery at 28 obstetric centers in Burkina Faso, Ghana, Kenya, Nigeria, Senegal and Sudan were interviewed about their personal, medical and obstetric histories and examined to determine if they had undergone genital mutilation. Using the classification system designed by the World Health Organization, trained study midwives divided the women into three groups, according to the type of mutilation—removal of the prepuce, with or without removal of all or part of the clitoris; removal of the clitoris, with total or partial removal of the labia minora; or removal of all or part of the external genitalia and stitching of the vaginal opening. Excluded from the sample were women scheduled for cesarean section, those for whom labor was too advanced to facilitate the required genital examination and those unable to give consent.

The study sites ranged from rural hospitals to urban teaching hospitals; deliveries were handled according to the protocol in place at each study center. The women and infants in the study were followed up until the mother's discharge from the hospital. Follow-up information included whether the woman had had a cesarean section, an episiotomy or perineal tear, the baby's birth weight and Apgar score, and whether there had been a stillbirth or a neonatal or maternal death.

Adjusted odds ratios from unconditional logistic regression analyses were used to calculate relative risks of obstetric complications. The final model adjusted for parity; maternal age, height, education and socioeconomic status; urban or rural residence; travel time to hospital; number of prenatal visits; and study site.

In all, 75% of participants had undergone genital mutilation; some 24% the least severe type, 27% the moderately severe type and 23% the most severe type. There were wide variations in the prevalence and severity of genital mutilation across countries. For example, overall prevalence among the study participants ranged from 40% in Ghana to 88% in Nigeria. Moreover, in Ghana, Nigeria and Senegal, only 1% of participants had undergone the most severe type of mutilation, compared with 73% in Sudan.

When compared with women who had not, women who had undergone the moderately or most severe type of mutilation were significantly more likely to have postpartum blood loss of at least 500 ml (relative risks, 1.2 and 1.7, respectively) and to have had a cesarean section (1.3 and 1.3). Among women who delivered vaginally, the relative risk of staying in the hospital for longer than three days was higher among women who had undergone the moderately or most severe types of genital mutilation than among those who had not undergone any type (1.6 and 2.3). The relative risk of a longer hospital stay was not affected by whether a woman had given birth before.

Among women who had never given birth before, 41% of those without genital mutilation had episiotomies; 88% of women with the most

severe type had one. Among women who had given birth before, the percentage having an episiotomy ranged from 14% among women without genital mutilation to 61% among women who had undergone the most severe type of mutilation. As with length of hospital stay, the relative risks of episiotomy for primiparous women increased according to the type of mutilation, from 1.3 among women with the least severe mutilation to 1.8 among those with the most severe type. The relative risks were even higher for multiparous women, rising with the severity of mutilation from 1.8 to 2.2.

Further analyses examined the risk of perineal tears associated with genital mutilation among women who had not had an episiotomy. For women who had never given birth before, the relative risk rose from 1.3 among women with the least severe type of mutilation to 3.2 among those with the most severe type; for multiparous women, the relative risk rose from 1.4 to 1.9. A total of 54 women died before discharge, 45 of whom had undergone genital mutilation; there were too few deaths to calculate reliable risk estimates.

The infants born to women who had undergone genital mutilation were also at elevated risk for adverse outcomes. Infants born to women who had undergone the moderately severe and most severe types of mutilation were more likely to have required resuscitation at delivery (relative risks, 1.3 and 1.7) and more likely to have died while their mother was an inpatient (relative risks, 1.3 and 1.6) than infants born to women who had not had genital mutilation.

For women with any type of genital mutilation, the summary relative risk of stillbirth or infant death during the mother's hospital stay was 1.3 compared with the risk for women who had not undergone mutilation; thus, about 22% of perinatal deaths among infants born to women with genital mutilation can be attributed to the mutilation, although this figure should be interpreted with caution.

According to the researchers, the results indicate that childbirth is significantly more likely to be complicated by adverse outcomes in

women who have undergone any type of genital mutilation than in women who have not. They note that the study's findings may be limited by the fact that it took place in hospitals, even though the countries with the largest proportions of women who have had genital mutilation are among those with the most limited health care infrastructures. For that reason, they say, women who can afford hospital costs and those with high-risk deliveries may be over-represented in the sample; still, the finding that women who have undergone genital mutilation are at higher risk for obstetric complications is likely to be widely applicable. The investigators conclude that "adverse obstetric and perinatal outcomes can...be added to the known and harmful immediate and long-term effects" of female genital mutilation.—*L. Melhado*

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## Frequent Male Condom Use Decreases Women's Risk of HPV Infection

The more consistently women's male sex partners use condoms, the less likely women are to acquire genital human papillomavirus (HPV) infection, according to a longitudinal study among newly sexually active young women.<sup>1</sup> Compared with their counterparts whose male partners used condoms less than 5% of the time for vaginal intercourse, women whose partners used them at least half the time had a 50% lower risk of infection and women whose partners used them every time had a 70% lower risk. The pattern was similar in analyses restricted to types of HPV associated with a low risk of cervical cancer as well as those associated with a high risk.

Researchers invited female university students aged 18–22 years who were sexually inexperienced or newly sexually active to participate in the study. Every four months, the women underwent gynecologic examinations during which cervical and vulvovaginal samples were collected for HPV testing (by a polymerase chain reaction assay that detects 37 types of the virus) and for Pap testing. The women also recorded information about their daily sexual behavior in a Web-based diary every two weeks. The time that women were

considered to be at risk for infection began on the date of first intercourse, and factors potentially affecting the risk of HPV infection—the number of instances of vaginal intercourse, the number of new partners, the frequency of use of condoms by male partners, each partner's circumcision status and each partner's number of previous partners—were summarized for the eight-month period before each HPV test. Factors showing a statistical association at  $p < .10$  in univariate analyses were included in multivariate analyses.

Study results were based on 82 women who reported their first sexual intercourse with a male partner during the study or the two weeks before enrollment. On average, the women were about 19 years old and were followed for 34 months. The median number of instances of sexual intercourse reported was 48 per year, and the median number of new partners reported was one per year.

A total of 40 women experienced 126 type-specific HPV infections after first sexual intercourse, corresponding to a 37% cumulative incidence of a first HPV infection over a 12-month period. For every 100 woman-years at risk, there were roughly 38 infections when condoms were used by male partners for 100% of instances of vaginal intercourse in the preceding eight months, 62 infections when condoms were used 50–99% of the time, 160 when condoms were used 5–49% of the time and 89 when condoms were used less than 5% of the time.

In a multivariate analysis, women's likelihood of acquiring an HPV infection decreased significantly as the frequency of condom use increased. Relative to women whose partners used condoms for 5% or fewer instances of intercourse, women whose partners used them 50–99% of the time had a 50% lower risk of infection (hazard ratio, 0.5) and women whose partners used them 100% of the time had a 70% lower risk (0.3). The results were similar when analyses were restricted to infections with high-risk types of HPV, low-risk types of HPV or the four types covered by the HPV vaccine. Moreover, among women whose partners used condoms all of the time, the decrease in the risk of HPV infection did not vary by whether or not the women also had unprotected, nonpenetrative genital contact with their partners.

In addition, women whose partners had not had any previous partners had a markedly lower risk of becoming infected with HPV relative to their counterparts whose partners had

had at least one or an unknown number of previous partners (hazard ratio, 0.0). Women who had one new sexual partner or more than one had a sharp increase in risk relative to their counterparts who did not have any new partners (4.8 and 6.9, respectively). Neither the number of instances of vaginal intercourse nor a partner's circumcision status significantly affected the likelihood of acquiring an HPV infection.

A total of 15 women developed precancerous lesions of their cervix after first intercourse, corresponding to a 15% cumulative incidence of these lesions over a period of 24 months. For every 100 woman-years at risk, there were no lesions when condoms were used by male partners for 100% of instances of vaginal intercourse in the preceding eight months, 17 when condoms were used 50–99% of the time, 16 when condoms were used 5–49% of the time and 11 when condoms were used less than 5% of the time.

In a multivariate analysis, the frequency of condom use did not significantly influence women's risk of developing cervical lesions. However, compared with women who did not have any new sex partners, women who had one or more than one new partner had a sharply elevated risk (hazard ratios, 6.5 and 23.3, respectively).

Use of male condoms appears to reduce the risk of HPV transmission from men to women, the researchers conclude, while noting that the study's findings may not apply to older women or to women of lower socioeconomic status (proxied by lack of college education). Some HPV infections are to be expected despite consistent condom use because the virus can be spread by nonpenetrative genital contact and condoms are not always used correctly, they point out; nonetheless, the benefit observed is "encouraging" because the women studied were new to both intercourse and condom use. Given the reductions in risk achieved across broad categories of the virus, the researchers assert that even though the HPV vaccine is known to be effective against the four types of the virus that put women at highest risk for cervical cancer, "consistent condom use by their partners may protect women against infection with other high-risk types of HPV...." —*S. London*

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## Improving Work Situations During Pregnancy May Help Improve Outcome

Women whose jobs expose them to physically difficult and psychologically stressful conditions are at increased risk of having an infant who is small for gestational age, and the risk increases with the number of such conditions if they remain throughout pregnancy. However, according to a study of women who gave birth in Quebec, Canada, in the late 1990s, if potentially detrimental conditions are removed before 24 weeks' gestation, a woman is at no greater risk than she would have been if the conditions had not existed at the start of her pregnancy.<sup>1</sup>

The study population consisted of women who delivered live singleton infants in six regions of Quebec between January 1997 and March 1999. To examine the relationship between occupational conditions and having an infant who was small for gestational age (i.e., whose birth weight was below the 10th percentile for gestational age), researchers conducted telephone interviews shortly after delivery with women who had worked at least 20 hours per week and had only one job at a time while pregnant. During the computer-assisted interview, women provided details about their work schedule, the posture and physical effort demanded by their job, the structure of their workday (e.g., breaks and work process), psychosocial conditions on the job (e.g., psychological demands and women's latitude to make decisions) and workplace environment (e.g., noise and exposure to secondhand smoke). They also provided information about their obstetric history, medical profile, family responsibilities and socioeconomic characteristics, and about their newborn's characteristics. A total of 5,977 women completed interviews—1,536 whose infant was small for gestational age and 4,441 controls.

Seven in 10 women reported that at the beginning of their pregnancy, they had been exposed to at least one of six specific occupational conditions that could pose a threat to their health or the health of their fetus: night working hours, irregular or shift work, standing at least four hours daily, regularly lifting loads weighing seven kilograms or more, noise, and a moderate or high level of job strain combined with little on-the-job support. About half had been exposed to one or two of these conditions, and one in five had been exposed to

three or more. In Quebec, pregnant women in potentially risky occupational situations are legally entitled to be assigned to other tasks or, if that is not possible, to take a leave from work, receiving 90% of their salary until four weeks before their expected delivery date. Half of the women interviewed had taken advantage of one or both of these benefits.

In one set of logistic regressions, the researchers examined possible predictors of having one's job modified or taking leave from work to avoid exposure to potentially harmful occupational conditions. Results indicated that socioeconomic, lifestyle and medical characteristics were at best only weakly associated with the likelihood that women took these measures to reduce work-related risks. However, the likelihood was strongly associated with the presence of potentially harmful conditions at the beginning of pregnancy. Compared with women reporting none of the specified conditions, those reporting one had nearly three times the odds of taking preventive measures (odds ratio, 2.6); the differential grew steadily and sharply with the number of conditions (odds ratios, 7.1 for two conditions, 14.3 for three and 25.9 for four or more).

Another set of logistic regression analyses examined associations between a woman's likelihood of having an infant who was small for gestational age and her occupational conditions. These analyses indicated that the odds that an infant was small for gestational age increased steadily with the number of risky conditions present at the beginning of pregnancy; they were 30% higher among women with 4–6 conditions than among those with none. Moreover, if the conditions were not eliminated during pregnancy, the risk was significantly elevated (odds ratios, 1.3 for women with two potentially adverse conditions, 1.4 for those with three and 2.3 for those with 4–6). By contrast, if the conditions were eliminated before 24 weeks of gestation, the risk was no higher than it would have been in the absence of any potentially detrimental conditions at the beginning of pregnancy.

The researchers observe that their work largely confirms findings of earlier studies; however, they add, it builds on previous research by providing insight into the potential benefit of preventive measures. Their study, they conclude, "underscores the importance of taking into account modification of working conditions over the course of pregnancy in order to adequately evaluate their effects on pregnancy outcomes."—*D. Hollander*

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## In Malawi, Breast-Feeding Does Not Pose Health Risks For HIV-Positive Women

In Malawi, HIV-positive women who breast-feed their infants are no more likely to become ill or die than their counterparts who do not breast-feed, according to an analysis of longitudinal data from HIV-infected mothers and their newborns.<sup>1</sup> This finding was not affected by women's frequency or pattern of breast-feeding. In addition, the women's breast-fed infants were about 60% less likely to die in the first two years of life than their non-breast-fed counterparts, whether or not they were infected with HIV.

The data came from a pair of clinical trials conducted in Malawi in 2000–2003 that tested antiretroviral therapy for preventing mother-to-infant transmission of HIV. Blood samples were collected from HIV-positive mothers at the time of delivery to measure their HIV load and their hemoglobin level, and from their newborns to test for HIV infection. Social, demographic, medical and reproductive information was recorded at delivery. At each of 10 visits over the next two years, mothers were examined and were asked if they were breast-feeding; those who were breast-feeding their infants were asked how frequently they did so and whether they were giving their infants only breast milk (classified as exclusive breast-feeding) or breast milk plus other liquids or solids (classified as mixed breast-feeding). Multivariate analyses assessed associations of breast-feeding with maternal health and survival, and with infant survival, controlling for maternal age, initial maternal viral load and hemoglobin level, and body mass index (weight for height) at the follow-up visits.

A total of 2,000 women and their singleton infants were enrolled in the trials. On average, the women were about 25 years old and had had three live births. Eleven percent had not attended school, 63% had attended primary school and 26% had a higher level of education.

Slightly more than 2% of mothers died in the two years after delivery. The cumulative probability of death was 18 per 1,000 at one year and 32 per 1,000 at two years. Maternal

deaths were most commonly due to tuberculosis, pneumonia, malaria and diarrhea; the cause was unknown in about one-fifth of cases. About 16% of infants died in the two years after delivery. The cumulative probability of death was 132 per 1,000 at one year and 195 per 1,000 at two years. Infant and child deaths were most commonly due to respiratory infections, gastroenteritis and septicemia; the cause was unknown in about one-seventh of cases. The estimated proportion of infants and children surviving and not infected with HIV was 80% at one year and 73% at two years.

On average, women breast-fed their infants for 15 months overall, exclusively breast-fed for 2.4 months and practiced mixed breast-feeding for 11.7 months. In a comparison of measures of maternal health between women who did and did not breast-feed in the first year (to assess the possibility that health itself influenced this practice), the two groups of women did not differ with respect to initial HIV viral load or hemoglobin level, or body mass index at visits.

Women who breast-fed did not have a significantly different risk of death than their counterparts who did not breast-feed. In addition, the risk did not vary between women who breast-fed five or more times in a 24-hour period and those who did so less frequently, or between women who exclusively breast-fed and those who did not breast-feed. Women who practiced mixed breast-feeding had a lower risk of death than did those who did not breast-feed (hazard ratio, 0.3). In terms of other factors, the likelihood of maternal death was positively associated with initial viral load (3.8–3.9), and negatively associated with initial hemoglobin level (0.8) and body mass index (0.9).

Breast-feeding in general, its frequency and its pattern were not associated with increased risks of illness among the women, as assessed with three measures—hospitalization and use of medicines, the presence of HIV symptoms and the need for assistance with daily activities. In fact, the likelihood of hospitalization and use of medicines was lower among women who exclusively breast-fed than among those who did not breast-feed (odds ratio, 0.8), and the likelihood of needing help with daily activities was lower among women who breast-fed in general (0.7) and those who practiced mixed breast-feeding (0.7) than among women who did not breast-feed. All three measures of illness were positively associated with initial viral load (1.2–1.6), and negatively associated with initial hemoglobin level (0.9–1.0) and with body mass index (0.9). Also, women

younger than 25 years of age were less likely to experience illness than their older counterparts (0.6–0.7).

Infants and children who were breast-fed had a lower risk of death than their non-breast-fed counterparts (hazard ratio, 0.4). Both mixed and exclusive breast-feeding were protective when compared with no breast-feeding (0.5 and 0.4, respectively). In addition, infants' and children's risk of death was positively associated with their mother's initial viral load (2.6), but was negatively associated with maternal body mass index (0.9).

The association between breast-feeding and lower mortality remained when infants and children were stratified by their HIV status at 6–8 weeks of age. Specifically, compared with the risk of death among infants who were not breast-fed, the risk was lower among HIV-negative and HIV-positive infants alike who were breast-fed, regardless of pattern (hazard ratios, 0.3 and 0.4, respectively), those who received both breast milk and supplemental

foods (0.4 and 0.4) and those who were exclusively breast-fed (0.1 and 0.4).

The researchers conclude that breast-feeding by HIV-positive mothers does not appear to hasten the progression of their illness or their death; moreover, this practice can be life-saving for their children, although it also poses a risk of infection. These findings, they assert, support recommendations adopted by several countries for breast-feeding when breast milk substitutes are not available, despite maternal HIV infection. They note that AIDS, as measured by viral load, remains the main risk factor for death among mothers and children alike. "Therefore, providing antiretroviral treatment to mothers (and their children) should be a major priority in order to save lives," they contend.—S. London

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## In Guatemala, Men's Views of Wives' Decision-Making Power Affect Wives' Use of Health Facilities for Births

In western Guatemala, the more involved a woman feels in making household decisions, the greater her likelihood of reporting that in preparing for a recent birth, she and her husband developed a plan for addressing problems during the pregnancy, delivery and postpartum period.<sup>1</sup> A woman's sense of involvement in decision making is not, however, associated with two other behaviors that can ensure maternal and infant health. By contrast, the more a man feels that his wife plays a role in household decision making, the less likely she is to have delivered in a health facility. These findings, along with other results from a 2003 household survey, provide insight both into women's decision-making power in this part of Latin America and into the importance of including men in studies of relationships between couple dynamics and preventive health behaviors.

The survey, undertaken to measure the impact of the national Maternal and Neonatal Health Program, was conducted in three departments of western Guatemala. Interviewers surveyed all women aged 15–49 in selected households who were pregnant or had given birth in the previous 12 months, as well as the husbands of female respondents in every other household. Survey questions for women

and men were similar, and covered demographic and socioeconomic characteristics; household decision making; and knowledge about, attitudes toward and behavior regarding maternal health.

To measure women's decision-making power, analysts constructed scores based on responses to four questions: who in the household made the final decisions on the purchase of household items, on what to do if a child became ill, on whether to buy medicine for a sick family member and on what to do if a pregnant woman in the household became very ill. Possible responses were woman only, man only, couple, father-in-law, mother-in-law, father, mother and other. For each decision, the response was scored 1 if the woman was involved (solely or with her husband) and 0 otherwise; the sum of the scores represented an overall index of a woman's decision-making power. Using logistic regression, the analysts examined the associations between these scores and three behavioral outcomes, measured among couples in which the wife had given birth within the previous 12 months: whether they had planned for an emergency during pregnancy, delivery and the postpartum period; where the baby had been born; and whether the mother



and child had seen a health professional within four weeks after the birth.

Data were available for 546 couples, who made up the analytic sample. On average, the women were 27 years old and had had three children. Thirty-five percent had had no schooling, 44% a primary education and 20% a secondary or higher level of schooling; 22% worked for pay, and 53% reported a Mayan mother tongue. About half said that their household owned a means of transport, and about half reported that the household owned at least two of four specified items (radio, television, refrigerator and telephone). Of the 391 women who had recently given birth, 38% said that they had had a plan for emergencies related to the pregnancy or birth, 27% had delivered at a health facility and 37% had seen a health professional within four weeks after delivering.

For each type of decision explored in the survey, one or both spouses in the majority of couples (59–65%) said that the wife was involved in the final decision. In roughly half of these cases (29–34% of couples overall), both members of the couple reported that they made the decision jointly. Sole decision making by the wife was rarely reported by either spouse, but for each situation, about one-third of couples agreed that the husband made the decision alone. Couples' level of agreement about who made final decisions was high (64–74%). In three of the four specified situations, the proportion of couples in which both spouses reported that the wife participated in decision making increased with the woman's level of education and was higher if both partners were educated than if only one had been to school; in all four instances, it was greater among couples in which the wife was employed than among those in which she did not work outside the home. On average, both women and their husbands said that women were involved in two of the four types of decisions.

In multivariate analyses, women's self-reported decision-making role was positively associated with the likelihood that a couple had had a plan for addressing an emergency during pregnancy, delivery and the postpartum period: For every point that a woman scored on the decision-making index, her odds of this outcome increased by 32%. The odds of having delivered in a health facility and of having received professional care soon after giving birth were not associated with the number of decisions the woman reported playing a role in. Men's reports suggest a very different relationship between women's decision-making role and preventive

behavior. Each one-point increase in the score reflecting a man's perception of his wife's participation in household decisions was associated with a 12% decline in the odds that she had given birth in a health facility.

In discussing their findings, the researchers comment on the lack of association between women's decision-making scores and two of three preventive behaviors. Data limitations, they suggest, may be partly responsible. However, they also contend that inadequate knowledge of the importance of skilled health care, documented in an earlier study, may prevent women in western Guatemala from obtaining appropriate care.

In the analysts' view, their findings yield important lessons about the role of men in decision making and in couples' health behavior. They observe that because spouses do not always agree on the wife's role in decision making, "to understand couple dynamics regarding household decisions, men need to be interviewed." Nevertheless, they conclude, the finding that couples often agreed that the husband was the main decision maker "can help program planners working on maternal health to include men as targets for maternal health interventions."—*D. Hollander*

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## In Egypt, Beaten Wives Are Less Likely to Use Prenatal Care or Contraceptives

Egyptian women who have been beaten by their spouse are less likely than other women to use modern contraceptives or to have received professional prenatal care during their last pregnancy, according to an analysis of data from the 1995 Demographic and Health Survey (DHS).<sup>1</sup> When compared with women who reported no domestic violence, those reporting that they had ever been beaten by their husband were significantly less likely to have received prenatal care when pregnant with their last child (odds ratio, 0.2). Moreover, women reporting three or more incidents of abuse in the past year were significantly less likely than those reporting one or two incidents to be current users of female contraceptives (0.5).

Analyses were based on 6,566 currently married women aged 15–49 who completed the women's status module of the DHS as well as the main questionnaire. Participants provided data on their socioeconomic and demographic characteristics; knowledge, attitudes and practice regarding family planning; access to health information and services; and attitudes related to domestic violence and family planning. Information was also collected on their husbands and on couple dynamics. In addition, women were asked whether they had been beaten since they were married, who had perpetrated the violence, and how many times they had been beaten in the past year. The researchers examined whether women had received prenatal care for the last child born in the past 12 months; the average number of prenatal visits during that pregnancy (1–3 vs. four or more); and current use of female contraceptives. Univariate and multivariate logistic regressions were used to identify relationships between women's experience of domestic violence and use of prenatal care and contraceptives.

The majority of respondents were aged 25–39, lived in rural areas and had not completed secondary school (53–68%). Ninety-five percent were Muslim, and 82% did not work for cash. The women had a mean of 3.6 births, and more than one-half were married to men aged 30–44. Nearly six in 10 husbands had less than a secondary education. Thirty-four percent of respondents reported that they had ever been beaten by their husband; of these, 47% had been beaten in the past 12 months. Among women who reported violence during the past year, 38% had experienced three or more beatings in that period. Moreover, 54% of women who had ever been beaten reported that they had never talked to anyone about the abuse; of these, 52% said they kept quiet because it was "no use," and 8% said that being beaten was "part of life."

Substantial proportions of all respondents reported that their freedom of movement outside the home was restricted. Yet compared with women who had not been abused, significantly higher proportions of those reporting domestic violence were limited in their ability to go to the doctor (36% vs. 33%), visit relatives or friends (43% vs. 41%) or go into the neighborhood for recreation (90% vs. 83%).

Univariate analyses revealed several correlations between women's experience of domestic violence and use of prenatal care and contraceptives. Having ever been beaten and having been beaten in the past year were as-

sociated with decreased odds of having received prenatal care (odds ratios, 0.5 each). Among women who had experienced violence in the past year, those who had been beaten three or more times had higher odds of having received prenatal care than those who had been beaten once or twice (2.6), but were less likely to use contraceptives (0.7).

Multivariate analysis confirmed only one of the three bivariate associations between having been beaten and prenatal care: Women who had ever been beaten were less likely than those who had not to have received prenatal care when pregnant with their last child (odds ratio, 0.2); however, among women who had received prenatal care, those who had ever been beaten had higher odds of having made

four or more visits (36.5). The association between the frequency of being beaten and the use of contraceptives remained as well: Women who reported three or more beatings during the past year had lower odds of current contraceptive use than did those reporting one or two incidents (0.5). The number of reasons women gave to justify wife beating was negatively associated with their odds of reporting four or more prenatal visits (0.7).

The researchers acknowledge that the lack of information on the respondents' husbands and the larger socioeconomic and political environment in which the women live limited the study's ability to examine contextual factors. However, they note that their findings indicate "that wife beating is associated with negative

health outcomes, and that controlling behaviors play as important a role in abusive relationships in Egypt as they do in more industrialized societies." They recommend that campaigns be undertaken to increase knowledge and change attitudes about wife beating as well as to decrease the behavior itself. Moreover, they maintain that "it is crucial that specialized health services be provided in public as well as private institutions, and that the availability of such resources be made known to all women."—*R. MacLean*

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