

the percentage of complete cure, a combination of both mycologic and clinical cure, was also lower: T₁₂, 46% (49 of 107); T₁₆, 55% (54 of 98); I₃, 23% (25 of 107); and I₄, 26% (28 of 108). Only 6.8% (34 of 496) withdrew for adverse events, and those patients were evenly distributed among the 4 groups.

Recommendations for clinical practice
Continuous terbinafine is more effective than intermittent itraconazole at achieving the goal of clear toenail growth. There was 1 additional clinical cure at 72 weeks for every 4.3 patients treated for 12 weeks with continuous terbinafine. However, there are additional important considerations for the physician when determining whether to initiate any medical therapy for toenail onychomycosis. These include the low rate of complete cure, a significant rate of patient withdrawal because of adverse events, the high cost of treatment, any concurrent patient conditions (human immunodeficiency virus or acquired immunodeficiency syndrome, diabetes, immunocompromise, and so forth), and a recurrence rate of at least 22%¹ at 3 years after successful initial treatment.

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■ ELECTIVE CESAREAN DELIVERY TO PREVENT VERTICAL TRANSMISSION OF HIV

The International Perinatal HIV Group. The mode of delivery and the risk of vertical transmission of human immunodeficiency virus type 1: a meta-analysis of 15 prospective cohort studies. *N Engl J Med* 1999; 340:977-87.

Clinical question Does elective cesarean delivery reduce the risk of vertical transmission of human immunodeficiency virus type 1 (HIV-1)?

Background Almost 7000 HIV-infected women give birth each year in the United States, but the optimal strategy to reduce transmission to children remains unclear. This meta-analysis reviews cohort studies addressing whether cesarean delivery prevents HIV transmission.

Population studied This is a meta-analysis of data on 8533 mother-child pairs from 15 North American and European prospective cohort studies. Thirteen percent

of the mothers had advanced disease, defined as a prior diagnosis of acquired immunodeficiency syndrome or low CD4+ cell count, and 17% of the infants weighed less than 2500 g. Only 17% of the mothers received antiretroviral therapy, and no information was available about viral load. Thus, although the patients seem similar to those cared for by family physicians and obstetricians in the United States, an important difference is the low intensity of treatment of HIV-positive mothers in the study subjects. Monotherapy during pregnancy is now standard, and combination therapies are increasingly frequent.

Study design and validity This is a well-designed meta-analysis. Eligible studies were identified by a MEDLINE search and discussion with colleagues. The primary analysis was restricted to prospective cohort studies including at least 100 mother-child pairs enrolled before 1997 for which the route and circumstances of delivery and infant HIV infection status were known. Four categories of deliveries were distinguished: elective cesarean, nonelective cesarean, instrumental vaginal, and noninstrumental vaginal. Cesarean deliveries were considered elective if performed before the rupture of membranes and onset of labor. There was no evidence of heterogeneity among studies. Multivariate analysis was used to control for receipt of antiretroviral therapy, advanced maternal disease, and low birth weight. The weaknesses of the study are minor and include a poor description of the search criteria and study review process and the lack of sufficient control for confounding for viral load.

Outcomes measured The primary outcome measure was the rate of HIV-1 infection in infants. Clinically important outcomes of patient satisfaction, cost, and postdelivery complications were not addressed.

Results Elective cesarean delivery was associated with a much lower risk of vertical HIV transmission (odds ratio = 0.43; 95% confidence interval, 0.33 - 0.56); adjustment for covariates did not change this result. Among women who did not receive antiretroviral therapy, the rate of transmission was 10.4% for elective cesarean compared with 19.0% for other modes of delivery. With antiretroviral therapy, the transmission rate was only 2.0% for elective cesarean compared with 7.3% for other modes. The protective effect of elective cesarean delivery remained even when there was a short period between the rupture of membranes and delivery, suggesting that either the rupture of membranes or labor itself increases the risk of HIV transmission. If estimates for women receiving antiretroviral therapy are accurate, 1 case of vertical transmission of HIV would be prevented for every 19 women undergoing cesarean delivery before the onset of labor or rupture of membranes.

Recommendations for clinical practice This meta-analysis provides convincing evidence that elective cesarean delivery substantially reduces the risk of vertical transmission of HIV. It is important that this conclusion is supported by recent data from the European Mode of Delivery Collaboration,¹ a randomized controlled trial of 370 mother-infant pairs that showed an 80% reduction of risk of vertical transmission and minimal surgical complications for elective cesarean delivery. Given the low rate of antiretroviral therapy and the lack of information on viral load in this meta-analysis, the important question of whether elective cesarean delivery confers a clinically significant benefit when added to combination therapy remains unanswered.

Providers should offer cesarean delivery to their prenatal patients with HIV, while helping them weigh the benefit of preventing HIV transmission against the risks of surgical delivery. It should be kept in mind that elective cesarean delivery is only 1 component of a comprehensive strategy to reduce vertical transmission, which includes early detection through prenatal screening, use of antiretroviral therapy throughout pregnancy and in the neonatal period, and avoidance of breast-feeding.

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■ PERINEAL MASSAGE TO PREVENT PERINEAL TRAUMA DURING PREGNANCY

Labrecque M, Eason E, Marcoux S, et al. Randomized controlled trial of prevention of perineal trauma by perineal massage during pregnancy. *Am J Obstet Gynecol* 1999; 180:593-600.

Clinical question Can perineal massage during pregnancy prevent perineal trauma at birth?

Background There is clear evidence supporting the restrictive use of episiotomy to minimize perineal trauma during delivery, but data documenting the benefits of other interventions are sparse.¹ Perineal massage during pregnancy has been advocated to increase elasticity and reduce the risk of perineal trauma from episiotomy or spontaneous tears.

Population studied Participants included a total of 1527 pregnant women who had a previous vaginal delivery ($n = 493$) and who had not ($n = 1034$) from 5 hospitals in Quebec, Canada. Women at high risk of cesarean delivery were excluded.

Study design and validity This was a randomized single-blind controlled study of 10 minutes of perineal massage daily beginning in the 34th or 35th week of pregnancy compared with usual obstetric care. The study was well designed and had adequate power to detect significant differences in outcomes. Randomization was stratified by history of previous vaginal birth, specialty of attending physician, and hospital. Physicians were encouraged to limit use of episiotomies. All participants were provided with information on episiotomies and perineal trauma, and the study nurse also taught women in the experimental group perineal massage. This massage consisted of introducing 1 or 2 fingers 3 to 4 cm deep into the vagina and applying and maintaining pressure, first downward for 2 minutes and then for 2 minutes to each side of the vaginal entrance. Women were given a bottle of sweet almond oil to use for lubrication.

Participants in the massage group were instructed to keep daily diaries recording whether massage was done, and a postpartum questionnaire was given to determine the frequency of massage. The 2 instruments were used to calculate the degree of compliance. Using a standardized form, physicians provided information on the state of the perineum immediately after the delivery. All participants completed a postpartum questionnaire assessing their experience with perineal massage, feelings of control, and satisfaction with the delivery. Analysis was by intention to treat.

Outcomes measured The primary outcome measure was delivery with an intact perineum (no laceration or unsutured first-degree tear). Secondary outcomes were rate of episiotomy and severity of perineal tears. Additional outcomes included satisfaction with the delivery experience and sense of control.

Results Among women without a previous vaginal birth, 24.3% from the perineal massage group and 15.1% from the control group were delivered vaginally with an intact perineum, for an absolute difference of 9.2% (95% confidence interval, 3.8% - 14.6%; $P = .001$; number needed to treat = 11). There was no difference in this group in the proportion of deliveries with episiotomy, and there was no significant difference in the number of third- and fourth-degree perineal lacerations. The incidence of delivery with an intact perineum increased with greater frequency of massage for women without a previous vaginal birth. There was no statistically significant difference between treatment and control groups in the proportion of women with previous vaginal deliv-