ACOG Committee Opinion

Committee on Obstetric Practice

Number 304, November 2004

Prenatal and Perinatal Human Immunodeficiency Virus Testing: Expanded Recommendations

ABSTRACT: Early identification and treatment of all pregnant women with human immunodeficiency virus (HIV) is the best way to prevent neonatal disease. Pregnant women universally should be tested for HIV infection with patient notification as part of the routine battery of prenatal blood tests unless they decline the test (ie, opt-out approach). Repeat testing in the third trimester and rapid HIV testing at labor and delivery are additional strategies to further reduce the rate of perinatal HIV transmission. The Committee on Obstetric Practice makes the following recommendations: follow an opt-out prenatal HIV testing approach where legally possible; repeat offer of HIV testing in the third trimester to women in areas with high HIV prevalence, women known to be at high risk for HIV infection, and women who declined testing earlier in pregnancy, as allowed by state laws and regulations; use conventional HIV testing for women who are candidates for third-trimester testing; use rapid HIV testing in labor for women with undocumented HIV status; and if a rapid HIV test result is positive, initiate antiretroviral prophylaxis (with consent) without waiting for the results of the confirmatory test.

The Centers for Disease Control and Prevention (CDC) estimates that 40,000 new human immunodeficiency virus (HIV) infections still occur in the United States each year (1). This figure includes approximately 300 infants infected via mother to child (vertical) transmission (2). Antiretroviral medications given to women with HIV perinatally and to their newborns in the first weeks of life reduce the vertical transmission rate from 25% to 2% or less (3–6). Even instituting maternal prophylaxis during labor and delivery or neonatal prophylaxis within 24–48 hours of delivery can substantially decrease rates of infection in infants (4). A retrospective review of HIV-exposed infants in New York State showed a transmission rate of approximately 10% when zidovudine prophylaxis was begun intrapartum and for newborns up to 48 hours of life (4). However, when neonatal prophylaxis was begun on day 3 of life or later, the transmission rate was 18.4% compared with 26.6% in the absence of any prophylaxis. Early identification and treatment of pregnant women and treatment of newborns in the first hours of life are essential to prevent neonatal disease.

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Prenatal and perinatal human immunodeficiency virus testing: expanded recommendations. ACOG Committee Opinion No. 304. American College of Obstetricians and Gynecologists. Obstet Gynecol 2004;104:1119–24.

Prenatal Approaches to Offering Human Immunodeficiency Virus Testing: Opt-In Versus Opt-Out

Variations of 2 prenatal HIV testing strategies are being practiced by obstetric providers in the United States. The opt-in approach is the strategy that requires specific informed consent, usually in writing, and is the foundation for most state laws and regulations in effect today.

The opt-out approach is the strategy in which universal HIV testing with patient notification is a routine component of prenatal care. A pregnant woman is notified that she will be tested for HIV as part of the routine battery of prenatal blood tests unless she declines. If a patient declines HIV testing, this should be noted in the medical record. The use of patient notification provides women the opportunity to decline testing but eliminates the requirement to obtain specific informed consent. Although no states currently have adopted an opt-out approach as defined previously, some states have adopted variations of this approach and others are reviewing the opt-out approach.

The opt-out approach is associated with greater testing rates than the opt-in approach. Medical record surveys, laboratory data, and population-based surveys (1998–2001) report 85% to 98% HIV testing rates in surveyed areas using the opt-out approach, compared with testing rates ranging from 25% to 83% in surveyed areas using the opt-in approach (7). Based on these data, in 2003 the CDC revised its guidelines to recommend the opt-out approach (8). Additionally, the CDC recommends that jurisdictions with statutory barriers to such routine prenatal screening consider revising them.* The American College of Obstetricians and Gynecologists, the American Academy of Pediatrics (9), and the CDC recommend the opt-out approach (8, 9).

Physicians should be aware of and follow their states' prenatal HIV screening requirements. Specific prenatal HIV screening requirements may be verified by contacting state or local public health departments.

*Gerberding JL, Jaffe HW. Dear colleague letter from CDC and NCHSTP directors on HIV testing. Atlanta (GA): Centers for Disease Control and Prevention; 2003. Available at: http://www.cdc.gov/hiv/rapid_testing/rt-appendix_a.htm. Retrieved June 30, 2004.

Conventional Prenatal Human Immunodeficiency Virus Testing

The conventional HIV testing algorithm, which generally takes up to 2 weeks to process, begins with a screening test, the enzyme-linked immunosorbent assay (ELISA), that detects antibodies to HIV; if the results are positive, it is followed by a confirmatory test, either a Western blot or an immunofluorescence assay (IFA). A positive ELISA test result is not diagnostic of HIV infection unless confirmed by the Western blot or IFA. The sensitivity and specificity of ELISA with a confirmatory Western blot test are greater than 99%. The false-positive rate for ELISA with a confirmatory Western blot test is 1 in 59,000 tests. If the ELISA test result is positive and the Western blot or IFA test result is negative, the patient is not infected and repeat testing is not indicated.

If the ELISA test result is repeatedly positive and the Western blot result contains some but not all of the viral bands required to make a definitive diagnosis, the test result is labeled indeterminate. Most patients with indeterminate test results are not infected with HIV. However, consultation with a provider well versed in HIV infection is recommended. This specialist may suggest viral load testing or repeat testing later in pregnancy to rule out the possibility of recent infection.

If the screening (eg, ELISA) and confirmatory (eg, Western blot or IFA) test results are both positive, the patient should be given her results in person. The implications of HIV infection and vertical transmission should be discussed with the patient. Additional laboratory evaluation, including CD4 count, HIV viral load, hepatitis C virus antibody, complete blood count with platelet count, and baseline chemistries with liver function tests, will be useful before prescribing antiretroviral prophylaxis. Consultation with a provider well versed in HIV infection is recommended.

Repeat Human Immunodeficiency Virus Testing in the Third Trimester

Routine universal repeat testing in the third trimester may be considered in health care facilities in areas with high HIV prevalence among women of childbearing age (ie, 5 per 1,000 or 0.5% or greater). Additionally, although physicians need to be aware of and follow their states' perinatal HIV screening

guidelines, repeat testing in the third trimester, preferably before 36 weeks of gestation, is recommended for pregnant women at high risk for acquiring HIV (10). Criteria for repeat testing can include:

- A history of a sexually transmitted disease
- Illicit drug use or the exchange of sex for money or drugs
- Multiple sex partners during pregnancy or a sex partner(s) known to be HIV-positive or at high risk
- Signs or symptoms suggestive of acute HIV infection at any time during pregnancy

Women who are candidates for third-trimester testing, including those who previously declined testing earlier in pregnancy, should be given a conventional HIV test rather than waiting to receive a rapid test at labor and delivery as allowed by state laws and regulations.

Rapid Human Immunodeficiency Virus Testing

Rapid HIV testing can be used to identify HIV infection in women who arrive at labor and delivery with undocumented HIV status and to provide an opportunity to begin prophylaxis of previously undiagnosed infection before delivery. A negative rapid HIV test result is definitive. A positive HIV test result is not definitive and must be confirmed with a supplemental test, such as a Western blot or IFA (11); however, antiretroviral prophylaxis should be initiated (with consent) without waiting for the results of the confirmatory test to further reduce possible transmission to the infant.

A rapid HIV test is an HIV screening test with results available within hours. Data from several studies indicate that 40–85% (11–14) of infants infected with HIV are born to women whose HIV infection is unknown to their obstetric provider before delivery. Some of these women have had no opportunity to learn their HIV status before labor, and recent data suggest that knowledge of HIV status, even if only obtained in labor, will allow the use of therapies that may reduce rates of vertical transmission. If a rapid test is used in labor and HIV antibodies are detected, the pregnant woman should be encouraged to start antiretroviral prophylaxis. Recommendations for the use of antiretroviral medications in pregnant women infected with HIV-1 are available at http://www.aidsinfo.nih.gov/guidelines/perinatal/PER_062304.html and are updated frequently (15). In some cases, cesarean delivery may provide additional protection against vertical HIV transmission; however, once labor has begun or rupture of membranes has occurred, the utility of cesarean delivery is unknown.

When selecting a rapid HIV test for use during labor and delivery, it is important to consider the accuracy of the test and the site where testing will be performed. Tests that require serum or plasma (eg, Reveal) are more suitable for use in the laboratory, whereas tests that can be performed with whole blood (eg, OraQuick, Uni-Gold) without specimen processing can be performed more easily in the labor and delivery unit (11). Performance evaluations on 3 U.S. Food and Drug Administration (FDA)-approved rapid HIV tests (OraQuick, Reveal, and Uni-Gold) indicate a sensitivity of 100%, 99.8%, and 100% (95% confidence interval), respectively, and a specificity of 99.9%, 99.1% (serum), and 99.7% (95% confidence interval), respectively (11, 16) (Table 1).

The CDC-sponsored Mother-Infant Rapid Intervention at Delivery (MIRIAD) Study Group examined the use of rapid testing using OraQuick or enzyme immunoassay (EIA) in 4,849 prenatal patients with unknown HIV status in a multistate hospital study (16). Human immunodeficiency virus-1 test results were positive for 34 women (HIV prevalence 7/1,000). Data from that study showed a sensitivity for OraQuick of 100% and a specificity of 99.9% with a positive predictive value of 90% compared with 76% for EIA. Offering rapid HIV testing during labor is feasible in obstetric settings, and the OraQuick Rapid HIV-1 Antibody Test, used on whole blood specimens, delivers accurate and timely (20–40 minutes) test results (11).

As with all screening tests before confirmation, the likelihood of a false-positive result is higher in populations with low HIV prevalence when compared with populations with high HIV prevalence. Additionally, at present it is not known how the false-positive rate for rapid testing will compare with the false-positive rate for conventional testing. Available calculated comparisons of the positive predictive values of 3 FDA-approved rapid HIV-1 antibody tests (OraQuick, Reveal, and Uni-Gold) and for the HIV-1 EIA in populations with differing HIV prevalence rates are shown in Table 1.

If the rapid HIV test result is positive, the obstetric provider should take the following steps:

1. Tell the woman she may have HIV infection and that her neonate also may be exposed
2. Explain that the rapid test result is preliminary and that false-positive results are possible
3. Assure the woman that a second test is being done right away to confirm the positive rapid test result
4. Initiate (with consent) antiretroviral prophylaxis without waiting for the results of the confirmatory test to reduce the risk of transmission to the infant
5. Tell the woman that she should postpone breastfeeding until the confirmatory result is available because she should not breastfeed if she is infected with HIV
6. Inform pediatric colleagues of positive maternal test results, as allowed by federal and state privacy laws, so that they may institute the appropriate neonatal prophylaxis

If the results of the rapid test and the confirmatory test are discrepant, both tests should be repeated and consultation with an infectious disease specialist is recommended. Additionally, all antiretroviral prophylaxis should be stopped if the confirmatory test result is negative (11).

Oral fluid based rapid HIV testing (OraQuick Rapid HIV-1/2 Antibody Test) is now available. This may be another option for perinatal testing in the future (see http://www.cdc.gov/hiv and http://www.fda.gov/cber/pma/p01004710.htm).

Recommendations

Given the enormous advances in HIV prophylaxis for pregnant women and newborns, it is clear that early identification and treatment of all pregnant women with HIV is the best way to prevent neona-

Table 1. Estimated Positive Predictive Value of a Single Screening Test for Human Immunodeficiency Virus in Populations With Differing Human Immunodeficiency Virus Prevalence*

	Estimated Positive Predictive Value (%)			
Human Immunodeficiency Virus Prevalence (%)	**OraQuick† (blood) (CLIA-waived)**	**Reveal† (serum) (CLIA-moderate complexity)**	**Uni-Gold† (blood) (CLIA-moderate complexity)**	**Single Enzyme Immunoassay (EIA) (CLIA-high complexity)**
10	99	92	97	98
5	98	85	95	96
2	95	69	87	91
1	91	53	77	83
0.5	83	36	63	71
0.3	75	25	50	60
0.1	50	10	25	33
Test sensitivity (95% CI)	100	99.8	100	—
Test specificity (95% CI)	99.9	99.1	99.7	99.8

Abbreviation: CI, confidence interval; CLIA, Clinical Laboratory Improvement Act.

*Based on point estimate for specificity from the Mother-Infant Rapid Intervention at Delivery study for OraQuick and enzyme immunoassay (Bulterys M, Jamieson DJ, O'Sullivan MJ, Cohen MH, Maupin R, Nesheim S, et al. Rapid HIV-1 testing during labor: a multicenter study. Mother-Infant Rapid Intervention at Delivery (MIRIAD) Study Group. JAMA 2004;292:219–23.) and from the U.S. Food and Drug Administration summary basis of approval for the other tests (Rapid HIV antibody testing during labor and delivery for women of unknown HIV status: a practical guide and model protocol. Centers for Disease Control and Prevention. Atlanta (GA): CDC; 2004. Available at: http://www.cdc.gov/hiv/rapid/testing/materials/Labor&DeliveryRapidTesting.pdf.). In practice, the specificity and actual positive predictive value may differ from these estimates.

†Trade names are for identification purposes only and do not imply endorsement by the U.S. Department of Health and Human Services, the Centers for Disease Control and Prevention, or the American College of Obstetricians and Gynecologists.

Modified from Rapid HIV antibody testing during labor and delivery for women of unknown HIV status: a practical guide and model protocol. Centers for Disease Control and Prevention. Atlanta (GA): CDC; 2004.

tal disease. Pregnant women universally should be tested for HIV infection with patient notification as part of the routine battery of prenatal blood tests unless they decline the test (opt-out approach). The American College of Obstetricians and Gynecologists, the American Academy of Pediatrics, and the CDC[†] recommend the opt-out approach (8, 9). There are encouraging results from the MIRIAD Study Group (16) and other evidence (3–6, 11) to suggest that antiretroviral prophylaxis started in labor and delivery and for the infant in the first hours of life also can substantially reduce vertical transmission of the HIV virus. Therefore, the Committee on Obstetric Practice makes the following recommendations:

- Follow an opt-out prenatal HIV testing approach where legally possible
- Repeat offer of HIV testing in the third trimester to women in areas with high HIV prevalence, women known to be at high risk for HIV infection, and women who declined testing earlier in pregnancy, as allowed by state laws and regulations
- Use conventional HIV testing for women who are candidates for third-trimester testing
- Use rapid HIV testing in labor for women with undocumented HIV status
- If a rapid HIV test result is positive, initiate antiretroviral prophylaxis (with consent) without waiting for the results of the confirmatory test

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[†]Gerberding JL, Jaffe HW. Dear colleague letter from CDC and NCHSTP directors on HIV testing. Atlanta (GA): Centers for Disease Control and Prevention; 2003. Available at: http://www.cdc.gov/hiv/rapid_testing/rt-appendix_a.htm. Retrieved June 30, 2004.

Resources

Publications

American College of Obstetricians and Gynecologists. Scheduled cesarean delivery and the prevention of vertical transmission of HIV infection. ACOG Committee Opinion 234. Washington, DC: ACOG; 2000.

Institute of Medicine (US). Reducing the odds: preventing perinatal transmission of HIV in the United States. Washington, DC: The Institute; 1999.

Organizations

American College of Obstetricians and Gynecologists (http://www.acog.org; http://sales.acog.org)

CDC Division of HIV/AIDS Prevention: (404) 639-0900

Centers for Disease Control and Prevention (http://www.cdc.gov/hiv)

National AIDS Hotline: 800-342-AIDS (2437) (English); 800-344-7432 (Spanish); 800-243-7889 (TTY)

National HIV Telephone Consultation Service (for physician consultation only): 800-933-3413

State public health departments