Prenatal Detection of HIV Seropositivity in an Urban Practice

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Human immunodeficiency virus (HIV) disease is a rapidly increasing problem and cause of death in children. It is currently the 9th leading cause of death in children aged 1 to 4 years, and will probably become one of the five leading causes of death in this age group by 1992.[1]

The primary route of pediatric infection is maternal transmission. Studies have shown that 30% to 50% of the infants born to women with HIV infection will acquire the infection.[2–4] Unfortunately, HIV infection in children is eventually fatal.[1] The diagnosis of HIV infection in infants is extremely difficult until the child is seriously ill. Accurate diagnosis is hampered by the presence of passively acquired maternal antibody, the difficulty in performing viral cultures, and the nonspecificity of signs and symptoms of HIV infection in infants.[2,5] Early diagnosis in infants is necessary, however, to identify infants who may benefit from early treatment.[2,6–8]

If identification of all HIV-seropositive mothers could be made prenatally, most children at risk for acquiring HIV infection congenitally could be identified. Incidences of 0% to 4.3% have been reported in women in prenatal clinics.[4,9,10] These studies, however, seldom have been able to have all prenatal patients tested. Furthermore, if only women at high risk for exposure to HIV were tested (blood transfusion recipients, former intravenous drug abusers, prostitutes, or sexual partners of intravenous drug abusers, known HIV-positive men, or bisexual men), almost one half of the HIV-positive women would be missed.[10,11] Thus, more conventional testing of prenatal patients may be necessary to determine which infants may be at risk for developing HIV disease. A study was undertaken to determine the incidence of HIV seropositivity in an urban, lower income, low-risk prenatal population, and to discover whether the women and infants at risk would be identified solely by risk factor history.

Methods

All prenatal patients in the St Francis Family Practice Center who were expected to give birth between January 1, 1988, and January 1, 1990, were counseled about the indications, reliability, advisability, and availability of testing for HIV seropositivity. St Francis Hospital Family Practice Center serves a lower-class and lower-middle-class inner-city population. Because the obstetric population is served by family physicians, women with a history of current intravenous drug abuse are not accepted into the prenatal population, since they are considered to be at high risk. All the women were questioned as to the presence of risk factors for exposure to HIV (Table 1). After counseling, all the women asked to be tested. The women were tested both at their first prenatal visit and again at 34 weeks' gestation. All women who tested positive received further counseling and comprehensive follow-up.

All specimens were tested by enzyme-linked immunosorbent assay (ELISA) testing. Those specimens that were reactive were further tested by Western blot.

Results

There were 314 prenatal patients who expected to give birth between January 1, 1988, and January 1, 1990. After counseling, all the women asked to be tested for seropositivity to the HIV antibody. All women were questioned as to the presence or absence of risk factors to HIV exposure. Demographically, the women were a mixed group by age and parity (Table 2). Twenty percent of the patients had health insurance, 40% were covered by Medicaid, and 40% had no health insurance.

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Table 1. Women at Known Risk for HIV Infection

Blood transfusion recipients (1975–1988)
Intravenous drug abusers
Prostitutes
Sexual partners of
Intravenous drug abusers
Known HIV-positive men
Men with hemophilia
Men with bisexual lifestyle

There were nine women who had a history of one of the known risk factors for HIV exposure. Six had received previous blood transfusions; three had abused intravenous drugs in the distant past. None of the six women who had blood transfusions tested positive for exposure to HIV. Two out of three who had used intravenous drugs were HIV seropositive. A third woman, who despite questioning, denied any history that would have placed her at high risk for HIV exposure, tested positive for HIV. After her HIV positivity became apparent, her sexual partner repeatedly denied exposure to HIV or behaviors that would have placed him at risk for HIV seropositivity. Only when testing showed that he was HIV positive did he reveal some remote homosexual experiences.

Discussion

With the increasing incidence of, death rate of, and serious infections in children with HIV disease, it is becoming more important to identify these children as soon as possible. Early identification and treatment may delay the onset of severe illness. Furthermore, early identification is necessary to avoid immunizing such children with live-virus immunizations. Early detection and diagnosis of HIV is difficult in children. If the mother is HIV-positive, passively acquired maternal antibody to HIV can cross the placenta, as many other immunoglobulin G antibodies can, making neonatal detection of HIV complicated. The infant will appear HIV positive even if it has not acquired the virus. The use of viral cultures as a method of detecting and diagnosing HIV infection in the infant is difficult and impractical. HIV infection presents in children with nonspecific signs and symptoms.[2,5] Waiting for clinical disease is often too late, as children may present for the first time with terminal infections. DNA polymerase chain testing for the presence of HIV antigens, although currently experimental, may allow more accurate and early diagnosis of HIV in infants.[2,5] If prenatal diagnosis of all mothers who are seropositive for HIV could be accomplished, all children at risk might be identified as early as possible.

Table 2. Age and Parity of Prenatal Patients at St Francis Family Practice Center, January 1, 1989–January 1, 1990

	HIV Status	
	Seronegative (n = 311)	Seropositive (n = 3)
Demographics	No. (%)	No. (%)
Age (years)		
<20	125 (40)	0
>20	186 (60)	3 (100)
Parity		
0	158 (51)	2 (66)
>0	153 (49)	1 (33)

Thus far, prenatal screening for HIV has been directed primarily at those women at high risk. Several studies[9–11] have shown that many women who test seropositive would be missed if only those women who are at high risk are tested. This study, in which all prenatal patients in an inner-city lower-income population were tested, establishes the prevalence of seropositivity in this low-risk population, which was as high as other high-risk populations. The prevalence in this population does not necessarily reflect that of any other population.

The rate of HIV seropositivity, 1%, in this population is equal to or higher than those previously reported in other inner-city prenatal centers in Atlanta (0.28%)[11] or Chicago (1.1%).[10] In this study, one out of three of the women who tested positive for HIV antibody did not report any risk factors. This percentage is slightly lower than that of one study in Chicago,[10] in which 5 out of 11 HIV-seropositive women did not report any risk factors, while in another study[11] 7 out of 10 seropositive women did not report any risk factors.

The inherent linkage of HIV-related illness in women with children requires that all physicians who care for prenatal patients address the detection of HIV seropositivity during pregnancy, the interruption or reduction of perinatal transmission, and the treatment of the infected neonate. Unless all prenatal patients are offered and encouraged to undergo testing for exposure to the AIDS virus, some seropositive women and thus their children at risk may be missed.

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