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Sex Differences in Morbidity and Mortality Among Children With Perinatally Acquired Human Immunodeficiency Virus Infection in New York City

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Studies on sex differences among adults with human immunodeficiency virus (HIV) have shown conflicting results. We sought to evaluate sex differences in morbidity and mortality among perinatally HIV-infected children. The study population included HIV-infected children born in 1990-1998 and enrolled in the Centers for Disease Control and Prevention (Atlanta, Ga)–funded the Pediatric Spectrum of HIV Disease project in 10 hospitals in New York City, NY. Medical records were reviewed every 6 months or until the child was no longer in care at the sites or died. All study children, stratified into 3 birth cohorts (1990-1992, 1993-1995, and 1996-1998), were evaluated for HIV infection within 3 months of birth.

This study includes 269 boys and 303 girls. During follow-up, 58 boys and 70 girls died; 117 boys and 111 girls developed AIDS-defining conditions. Tests for sex differences in Kaplan-Meier curves for survival and AIDS incidence were not significant overall and within each cohort (Figure), but the 1996-1998 cohort showed better survival and lower AIDS incidence than earlier cohorts, as observed in previous studies.[1-2] The survival probability to 6 years of age is similar to that of 2 European studies.[3-4]

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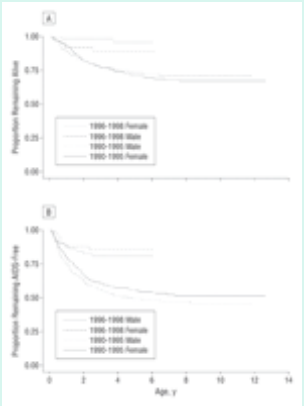

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Figure. Kaplan-Meier estimated survivals (A) and AIDS incidence (B) among children with perinatal human immunodeficiency virus (HIV) born 1990-1998 by sex and birth cohort, New York City, the Pediatric Spectrum of HIV Disease project. Because there was no significant difference in time to death and AIDS incidence between the 1990-1992 and 1993-1995 cohorts, the 1990-1995 and 1996-1998 cohorts were combined.

Boys had a higher incidence of lymphoid interstitial pneumonia as the first-diagnosed AIDS-defining condition than girls overall (odds ratio [OR], 2.21 [95% confidence interval (CI), 1.17-4.21]) but a lower incidence of HIV encephalopathy than girls in the 1990-1992 cohort. Among ever-diagnosed AIDS-defining conditions, boys had a higher incidence of lymphoid interstitial pneumonia overall (OR, 2.63 [95% CI, 1.47-4.72]) and within the 1990-1992 and 1993-1995 cohorts but a lower incidence of esophageal candidiasis than girls overall (OR, 0.23 [95% CI, 0.06-0.71]) and within the 1990-1992 cohort. This has not been previously documented in HIV-infected children, and the significance is not known.

Five hundred nineteen children (91%) were prescribed prophylaxis against *Pneumocystis jiroveci* pneumonia. The proportion of children prescribed prophylaxis within 6 months of birth was 15% of the 1990-1992 cohort, 53% of the 1993-1995 cohort, and 85% of the 1996-1998 cohort. Overall, 106 (19%) had no documented antiretroviral (ARV) use and 466 (81%) were prescribed ARV therapy. The proportion of children prescribed ARV therapy within 6 months of birth was 2% of the 1990-1992 cohort, 19% of the 1993-1995 cohort, and 70% of the 1996-1998 cohort. There were no sex differences in age at initiation of *Pneumocystis jiroveci* pneumonia prophylaxis or ARV use overall or within each cohort. The 1996-1998 cohort received more ARV combination regimens (44%) containing protease inhibitors as first ARV therapy than the earlier cohorts (3%-6%). There were no sex differences in the types of first ARV therapy overall and within each cohort.

We examined pairs of $CD4^+$ T-cell counts and HIV-1 RNA level within the first year of life for the 1996-1998 cohort. One pair corresponding to the first 6 months of life (n = 53) and 1 pair to the second 6 months of life (n = 57) were examined. No sex differences were found in the median $CD4^+$ T-cell counts and HIV-1 RNA levels within each half of the first year. Stratified by $CD4^+$ T-cell count (<1500 and ≥1500 cells/mm^3), boys and girls had no significant differences in HIV-1 RNA levels within each half of the first year.

The longitudinal study design allows us to observe disease progression across time. The improving trend in mortality and morbidity coincides with the introduction of new Centers for Disease Control and Prevention guidelines for prophylaxis and ARV therapy for HIV-infected children. Our findings suggest that sex differences in HIV-infected children may not be as significant as in HIV-infected adults.

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