

Children with perinatal HIV infection lived to an estimated mean age of 9.4 years

Barnhart HX, Caldwell MB, Thomas P, et al., and the Pediatric Spectrum of Disease Clinical Consortium. **Natural history of human immunodeficiency virus disease in perinatally infected children: an analysis from the Pediatric Spectrum of Disease Project.** *Pediatrics.* 1996 May;97:710-6.

Objective

To ascertain the natural history of HIV disease in children who have perinatal infection.

Design

Inception cohort study with 6-month updates of case records.

Setting

7 geographical regions in the United States and Puerto Rico.

Patients

Children who were perinatally infected with HIV and born between 1982 and 1993. 2148 children (45% African-American, 41% Hispanic, and 11% white) were studied.

Commentary

Early in the HIV epidemic, children with perinatal infection were described as having a rapidly progressive disease with short survival. These reports were biased, however, toward those with more rapidly progressive disease because children with severe illness were more likely to be identified. More recently, in prospective studies of children with perinatal HIV infection, the time to AIDS and survival time have both been found to be longer (1, 2).

In this study, Barnhart and colleagues use mathematical modeling to estimate the time spent in each clinical stage of illness from birth to death in a cohort of children with perinatal infection in the United States and Puerto Rico. Obviously, these estimates may not apply in countries that have different health care sys-

Assessment of prognostic factors

Children were categorised by progressive stages of disease using CD4⁺ T-lymphocyte count and clinical status: N, no symptoms or signs; A, mild symptoms and signs; B, moderate symptoms and signs; and C, severe symptoms and signs. A 5-stage Markov model (N, A, B, C, and death) was fitted to the data.

Main outcome measures

Death and progression of disease.

Main results

By the end of 1993, 458 children (21%) had died, 357 (17%) were in stage C, 1157 (54%) were in stage B, 143 (7%) were in stage A, and 33 (2%) were in stage N. The mean age of children who were alive was 50 months (median 43 mo), and the mean age of children at death was 32 months (median 23 mo). According to the Markov model, the estimated mean time spent in each stage was 10 months for N (95% CI 9 to 11), 4 months for A, (CI 3 to 4), 65 months for B (CI 60 to 70), and 34 months

for C (CI 31 to 37). The time to stage B was, on average, 14 months. Children with perinatal HIV infection had a 50% chance of having severe symptoms or signs by 5 years of age. The estimated mean survival times from the beginning of each stage were 9 years for N (CI 8.1 to 10.7), 8.6 years for A (CI 7.2 to 9.9), 8.2 years for B (CI 6.9 to 9.6), and 2.8 years for C (CI 2.6 to 3.1).

Conclusions

On average, children with perinatal HIV infection progressed to moderate symptoms in their second year of life. The estimated mean survival time from birth was 9.4 years.

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tems. The data show many potential biases, such as changes in diagnostic capabilities over time, changes in management over time, missed infants who had short survival, and incomplete case findings with asymptomatic mothers and children. Subgroup analyses were done to address these issues, and they showed that the potential biases probably did not substantially alter the results. The validity of the model is also supported by the similarity of the disease progression in the model to that in other recent prospective studies (1, 2).

The results of this study are useful for clinicians when they counsel families with children who are infected with HIV. The progression of illness described provides a more optimistic view for families than that based on the early reports. Because the longest-lasting stage, B, is one in

which children have moderate symptoms and signs, these children will require clinical care related to their HIV infection for most of their life and certainly long before they develop AIDS. This is an important factor for planning health care resources.

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