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 FREDERICK G. ADAMS, D.D.S., M.P.H., Commissioner

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LYME DISEASE - CONNECTICUT

From 1984 through 1986, CDC received an average of 1,500 reports of Lyme disease annually, making it the most common tick-borne disease reported to CDC. The disease takes its name from Lyme, Connecticut, where the full spectrum of illness was first described in 1975. To further study the incidence of disease among its residents, Connecticut conducted a laboratory-based program of surveillance for Lyme disease from July 1, 1984, to March 1, 1986.

Indirect immunofluorescence antibody (IFA) and enzyme-linked immunosorbent assays (ELISA) were used to detect antibodies to *Borrelia burgdorferi*, the spirochete that causes the disease. Serologic testing was offered to Connecticut physicians without cost for all residents with suspected Lyme disease if the serum was accompanied by a case report form. Residents who, in 1984 or 1985, had onset of erythema migrans and/or neurologic, cardiac, or arthritic manifestations characteristic of Lyme disease and a positive serologic test (IFA greater than or equal to 1:128 or ELISA greater than or equal to 1:160 with a polyvalent conjugate) were included in the study.

Thirty-seven percent of the 3,098 patients reported met the criteria for

inclusion in the study (460 in 1984 and 689 in 1985). In 1985, the first complete year of reporting, 66% of the patients studied had onset of symptoms from June through August. Twenty-four percent more patients had onset of symptoms from July through December 1985, than from July through December 1984 (492 compared with 397). Serologic testing was equally available during these time periods.

The incidence of Lyme disease for all Connecticut residents in 1985 was 22/100,000. Town-specific incidences ranged from zero to 1,156/100,000. Towns with the highest incidences were in southern Connecticut, east of the Connecticut River.

Fifty-one percent of patients with Lyme disease were male, and all but one of the 372 patients with known race reported in 1984 were white. Racial information was not gathered in 1985. Age-specific incidence was tabulated by 5-year age groups for patients reported in 1985. The incidence ranged from 11/100,000 for persons aged 20 to 24 years, to 39/100,000 for those aged 5 to 9 years.

Overall, 83% of the patients studied had erythema migrans; 24% had arthritis; 8% had neurologic manifestations; and 2% had cardiac involvement. For those with arthritis, affected joints were the knee (89%), hip (9%), shoulder (9%), ankle

(7%), and elbow (2%). In 1985, persons under 20 years of age were 1.6 times more likely to have arthritis than persons over 20 (7/100,000 compared with 4/100,000), while both groups were equally likely to develop erythema migrans (13/100,000). Seventy-nine percent of patients with arthritis did not report antecedent erythema migrans. Sixty-one percent of patients with erythema migrans reported a tick bite within 30 days of illness. Sera received before July 1, 1985, (1,447 samples) were tested by IFA; sera received later (1,579 samples) were tested by ELISA; 72 patients were reported without a request for serologic testing. For those with erythema migrans, the overall sensitivity of serology was 30% by IFA and 24% by ELISA. When the serum sample had been obtained 21 days or more after onset of symptoms, the sensitivity of the IFA increased to 45% and that of the ELISA, to 32%.

Reported by: LA Magnarelli, PhD, Connecticut Agricultural Experiment Station, New Haven; RW Ryan, PhD, RC Tilton, PhD, Univ of Connecticut School of Medicine; JA Hardin, MD, Yale Univ School of Medicine; DC Niejadlik, MD, Middlesex Memorial Hospital, Middletown; AH Sweeney, MPH, ML Cartter, MD, PJ Checko, MPH, PA Mahar, HC Chaski, MPH, JL Hadler, MD, MPH, State Epidemiologist, Connecticut State Dept of Health Svcs, AC Steere, MD, Tufts Univ School of Medicine, Boston, Massachusetts. Meningitis and Special Pathogens Br, Center for Infectious Diseases; Div of Field Svcs, Epidemiology Program Office, CDC.

Editorial Note: This study demonstrates the impact of Lyme disease in an endemic area. A comparison of the results with those of a 1977 study (1) reveals an increase of 163% in the incidence of Lyme disease in the eight towns reporting cases in 1977 and shows that, by the mid-1980s, the disease had spread inland from the coastal areas.

Serologic testing for Lyme disease has increased considerably in Connecticut. To

trace these changes in testing, the state health department recently compared the annual number of immunoglobulin or IgG-specific serologic tests for Lyme disease ordered by Connecticut physicians from January 1984 through August 1987. The number and results of these tests varied by year as follows: 2,492 in 1984 (30% positivity), 3,770 in 1985 (20% positivity), 5,175 in 1986 (24% positivity) and 6,420 through August of 1987 (14% positivity). This increase may reflect an actual increase in the incidence of Lyme disease or in the recognition of the disease by physicians. It may also reflect the increased availability of the laboratory test or its overuse, especially during the early stage of the disease, when the test is likely to be negative (2-4).

The diagnosis of early Lyme disease remains primarily clinical, and physicians should be aware of the limitations of current tests. Sensitivities of the IFA and the ELISA are relatively low during stage one (2-4), and the antibody response can be curtailed or aborted by early treatment with antibiotics (3). In contrast, some research laboratories have reported sensitivities greater than or equal to 95% for tests of patients with stage two or three Lyme disease (2,4,5). Test specificities approaching 100% have also been reported (2,6); however, considerable variability may occur among laboratories because the tests are not standardized and are difficult to perform. The sensitivities and lack of standardization of the tests preclude their use alone for routine disease reporting and reinforce the need to develop a reliable and practical case definition for surveillance that is not dependent on serologic test results.

Lyme disease is a problem of increasing national and international concern that merits continual and improved surveillance. Clinical studies to further define complications of the disease and to evaluate treatment regimens are needed. Public health education can help alert

people to the symptoms of Lyme disease and to the importance of avoiding tick bites. The development of other effective primary preventive measures, particularly vector control, is essential.

References

1. Steere AC, Broderick TF, Malawista SE. Erythema chronicum migrans and Lyme arthritis: epidemiologic evidence for a tick vector. *Am J Epidemiol* 1978; 108:312-21.
2. Craft JE, Grodzicki RL, Steere AC. Antibody response in Lyme disease: evaluation of diagnostic tests. *J Infect Dis* 1984; 149:789-95.
3. Shrestha M, Grodzicki RL, Steere AC. Diagnosing early Lyme disease. *Am J Med* 1985; 78:235-40.
4. Wilkinson HW. Immunodiagnostic tests for Lyme disease. *Yale J Biol Med* 1984; 57:567-72.
5. Craft JE, Grodzicki RL, Shrestha M, Fischer DK, Garcia-Blanco M, Steere AC. The antibody response in Lyme disease. *Yale J Biol Med* 1984; 57:561-5.
6. Magnarelli LA, Anderson JF, Johnson RC. Cross-reactivity in serological tests for Lyme disease and other spirochetal infections. *J Infect Dis* 1987; 156:183-8.

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PEDIATRIC AIDS PROJECTIONS

The AIDS Section frequently receives requests for projections on the number of pediatric and adult AIDS cases over the next few years. Projections on total adult AIDS cases have been relatively easy to make. We have borrowed from the U. S. Public Health Service projections, assuming that Connecticut will continue to contribute a constant 1.1-1.2% to the national total. These projections are not based on rates of infection. At present, accurate estimates of HIV infection rates are not available.

The numbers of pediatric AIDS cases are more difficult to project. We do not have good national projections from which to extrapolate. Even if such projections were available, our contribution to the national total has been more variable, between 2.0-3.0% (currently 2.2%). If we knew the actual number of women of childbearing age infected with HIV who were giving birth, we would be able to make an accurate estimate of the extent of pediatric HIV infection, but such data are not yet available. While the natural history of children born to HIV antibody-positive women is still being determined, it does look as if 40% of infants born to HIV antibody-positive mothers will show evidence of deep seated infection after their first year of life; of these, roughly 25% will have developed AIDS by 3 years of age. These estimates, are based on studies of small numbers of children and may be subject to future change.

To obtain accurate information on HIV infection in women of childbearing age and their offspring, we will be conducting a blinded HIV antibody seroprevalence study of all newborns in Connecticut. This will give us the number of women giving birth who are infected and the number of children who are HIV antibody-positive at birth. From these numbers, further extrapolation will be possible.

Until data from this study become available, only crude estimates of the numbers of children born to HIV antibody-positive women are possible. These estimates are based on the assumption that for every case of AIDS that has occurred to date in women of childbearing age, there are 20-50 women of childbearing age who are HIV antibody-positive. It also assumes that HIV antibody-positive women are as likely to have children at this time as women who are not HIV antibody-positive. Given these assumptions, we estimate that for 1987 between 118 and 294 HIV-infected women gave birth, and for 1986, between 79

and 207. More distant projections will depend on the rate at which HIV is being transmitted to women and the success of our attempts to educate HIV antibody-positive women about the risks of becoming pregnant. There will probably be at least 100-300 births per year to HIV antibody-positive women for the next few years. The children born to HIV antibody-positive women must be followed closely during their first year of life while they have maternally-acquired HIV antibody. After that, probably slightly less than half will show evidence of HIV infection and be at future risk for AIDS, ARC, and other HIV-related illness.

As of December 31, 1987, 95 of the 169 Connecticut towns had at least one resident reported as having AIDS. However, the geographic distribution of AIDS and correspondingly HIV infection in adults and children has not been uniform. A number of urban areas in Connecticut have had much higher rates of AIDS in residents than the rest of the state. These areas are Bridgeport, Danbury, Hartford, New Haven, Norwalk, Stamford and Waterbury. We estimate that 81% (104-260) of the HIV-infected women giving birth in 1987 will live in these seven towns, compared to only 19% (24-61) elsewhere.



COMMUNICABLE DISEASES REPORTED			
CONNECTICUT			
1986, 1987			
Name	1987 To Date *	1986 To Date	% Change From 1986
AIDS	188	196	- 4.1
GONORRHEA	10,547	9,987	+ 5.6
SYPHILIS P&S	336	161	+108.7
MEASLES	22	9	+144.4
RUBELLA	0	1	-100.0
TUBERCULOSIS	164	175	- 6.3
HEPATITIS A	190	213	- 11.0
HEPATITIS B	335	459	- 27.0
SALMONELLOSIS	1,440	1,085	+ 33.0
SHIGELLOSIS	235	135	+ 74.0

*Subject to change when final report is submitted to the Centers for Disease Control

James L. Hadler, M.D., M.P.H., Chief Thomas Farley, M.D.
 Patricia Checko, M.P.H. Matthew L. Cartter, M.D., Editor
 Sally Carr, Office of Health Education

EPIDEMIOLOGY SECTION
 PREVENTABLE DISEASES DIVISION
 State of Connecticut Department of Health Services

150 Washington Street
 Hartford, CT 06106

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