LYME disease SURVEILLANCE SUMMARY

Bacterial Zoonoses Branch
Division of Vector-Borne Infectious Diseases
National Center for Infectious Diseases
Centers for Disease Control

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NATIONAL LYME DISEASE REFERENCE SEROBANK: AN UPDATE

The National Lyme Disease Reference Serobank was established at CDC in 1990 [see LDSS, 1990, V1-N3: p. 3 and LDSS, 1991, V2-N1: pp. 2-3]. The serobank consists of specimens from patients with a clinical and/or bacteriologic diagnosis of Lyme disease. An increasing number of culture-confirmed cases are represented in the serobank. Recent systematic attempts to culture *Borrelia burgdorferi* from biopsies of erythema migrans lesions have resulted in positive yields of 40-80%, and the procedure is now being offered for routine diagnosis in at least one clinical center. The serobank is crucial to the development of better diagnostic tests and laboratory proficiency programs, and standardization of serologic testing for Lyme disease nationally.

The serobank currently contains nearly 40 large-volume specimens, but many more are needed. Priority is given to the collection of specimens from the following types of cases:

(1) culture-confirmed, regardless of serologic titer, and ideally accompanied by a urine sample and a low-passage subculture of the isolate of *B. burgdorferi*,

(2) non-culture-confirmed but clinically well-characterized, particularly if a low-positive or medium-positive titer of antibodies to *B. burgdorferi* is present.

Potential contributions will be considered by CDC staff, case-by-case, based on a consideration of the available clinical and laboratory data. Unit (250 ml) volumes are typically contributed, but smaller volumes can be accepted, particularly from pediatric cases. Serum is preferred but plasma is acceptable. Funds are available from CDC to compensate patients, physicians, and blood banks for the contribution and acquisition of these samples. For further details, contact Dr. Roy Campbell, CDC, P.O. Box 2087, Fort Collins, CO 80522-2087, Telephone (303) 221-6400 or FAX (303) 221-6476.

LYME DISEASE COOPERATIVE AGREEMENTS FOR EPIDEMIOLOGIC RESEARCH

Ten research projects on the epidemiology of Lyme disease have been funded by CDC as cooperative agreements for FY 1991. Project oversight for these studies is being provided by the Bacterial Zoonoses Branch, Division of Vector-Borne Infectious Diseases at Fort Collins. In previous issues of LDSS, we have listed funded projects dealing with Field Ecology and Tick Control (V2-N4; 6/91) as well as projects focused on Diagnosis, Immunology, and Pathogenesis (V2-N5; 7/91).

Projects Funded through May 1992

- Surveillance and Epidemiology of Lyme Disease in California. Robert S. Lane, Dr.PH. University of California at Berkeley.
- Lyme Disease in Virginia and North Carolina. Suzanne Jenkins, V.M.D., M.P.H. Virginia State Health Department.
- Epidemiology of Lyme Disease in Georgia. Michael Felz, M.D. Medical College of Georgia.
- Surveillance of Lyme Disease in Connecticut. Matthew L. Cartter, M.D. Connecticut State Department of Health.
- Evaluation of National Lyme Disease Surveillance. Richard L. Vogt, M.D. Council of State and Territorial Epidemiologists.
- Surveillance of Lyme Disease in Rhode Island. Barbara A. Debuono, M.D. Rhode Island State Health Department.
- Surveillance of Lyme Disease in Michigan. William N. Hall, M.D., M.P.H. Michigan State Department of Health.
- Epidemiology of Lyme Disease in New Jersey. Kenneth C. Spitalny, M.D. New Jersey State Department of Health.
- Epidemiology of Lyme Disease in Westchester County, New York. Durland Fish, Ph.D. New York Medical College.
- Surveillance and Epidemiology of Lyme Disease in New York State. Dale Morse, M.D. New York State Department of Health.

These cooperative agreements for epidemiologic studies are included in one or more of four basic categories: (1) studies to determine the value of active case detection in selected states; (2) studies to monitor epidemiologic patterns and trends in the same areas over time; (3) case-control studies to establish risk factors; and (4) studies of the effectiveness of community intervention methods.

CLINICAL MANIFESTATIONS OF LYME DISEASE

A State-of-the-Art Conference on the diagnosis and treatment of Lyme disease was held this past Spring at the National Institutes of Health. Although the proceedings of that conference have not yet been formally published in the scientific literature, a synopsis of the conclusions reached by panel participants has recently been provided by NIH in CLINICAL COURIER Vol. 9, No. 5 August 1991. Reproduced below is a table from that issue which was adapted from Steere AC. Medical Progress: Lyme disease. *N Engl J Med* **1989**;321:586-596. The table reinforces the concept that Lyme disease occurs as a spectrum from early to late stages of infection and that patients may present at various stages of this spectrum rather than progressing sequentially through discrete "stages" as may have been inferred from earlier models of the disease. Although fatigue is listed as a constitutional symptom in the following table, participants agreed that persistent fatigue is not common as a late manifestation.

TABLE 1
MANIFESTATIONS OF LYME DISEASE

SYSTEM	EARLY INFECTION---------->		LATE INFECTION
Skin	Erythema Migrans	Secondary annular lesions, molar rash, diffuse erythema or urticaria, evanescent lesions, lymphocytoma	Acrodermatitis chronica atrophicans, localized scleroderma-like lesions
Constitutional symptoms	Minor	Severe malaise and fatigue	fatigue
Musculoskeletal system		Migratory pain in joints, tendons, bursae, muscle, bone; brief arthritis attacks; myositis	Prolonged arthritis attacks, chronic arthritis, peripheral enthesopathy, periostitis or joint subluxations below lesions of acrodermatitis
Neurologic system		Meningitis, cranial neuritis, Bell's palsy, motor or sensory radiculoneuritis, subtle encephalitis	Chronic encephalomyelitis, spastic parapareses, ataxic gait, subtle mental disorders, chronic axonal polyradiculopathy
Lymphatic system	Regional lymphadenopathy	Regional or generalized lymphadenopathy, splenomegaly	
Heart		Atrioventricular nodal block, myopericarditis, pancarditis	
Eyes		Conjunctivitis	Keratitis

STUDY IN PROGRESS ON THE SEROLOGIC DIAGNOSIS OF LYME DISEASE

In a previous issue of LDSS (V2-N1), we discussed the results obtained from an evaluation of commercially available serologic test kits for Lyme disease. Part of the protocol for that study involved blind pretesting of the serum panel to be used for the final study by the CDC Reference Diagnostic Laboratory and two academic reference laboratories. The agreement on results was moderately good between CDC and one of the academic laboratories and was poor between CDC and the remaining laboratory as well as between the two academic institutions. The reason for this disparity in results was not clear, and a shortage of the serologic specimens available in that study precluded further evaluation of possible causes. The differences noted could have occurred as a result of sensitivity differences between the tests or due to real differences in test specificity. Significant differences in specificity among the tests would suggest the need for a methodologic evaluation of those serologic tests.

To evaluate the agreement of serologic testing results obtained by clinical research centers using their own testing procedures and by the CDC ELISA, a protocol was produced and circulated to centers who had expressed an interest in this problem. A purchase order for services has been awarded to five institutions to provide serum specimens from patients with a diagnosis of Lyme disease and who have antibodies to *B. burgdorferi* demonstrated by the serologic test in use by the contractor. The sera provided by each contracting institution will be used in addition to sera from the CDC reference collection to produce a test panel of sera which will be blind-coded and returned to the contractors to test for antibodies to *B. burgdorferi* using the contractor's routine test. The same test panel will also be tested blind by the CDC Reference Diagnostic Laboratory. Results will be analyzed at CDC and, in the event of significant variation in results, further studies will be undertaken to determine the source(s) of this variation.

Institutions and investigators participating in this study are:

1. Raymond J. Dattwyler, M.D.
   State University of New York
2. Arthur L. Reingold, M.D.
   University of California at Berkeley
3. Raymond W. Ryan, Jr.
   University of Connecticut Health Center
4. Leonard H. Sigal, M.D.
   Robert Wood Johnson Medical School
5. Allen C. Steere, M.D.
   New England Medical Center

FIFTH INTERNATIONAL CONFERENCE ON LYME BORRELIOSIS

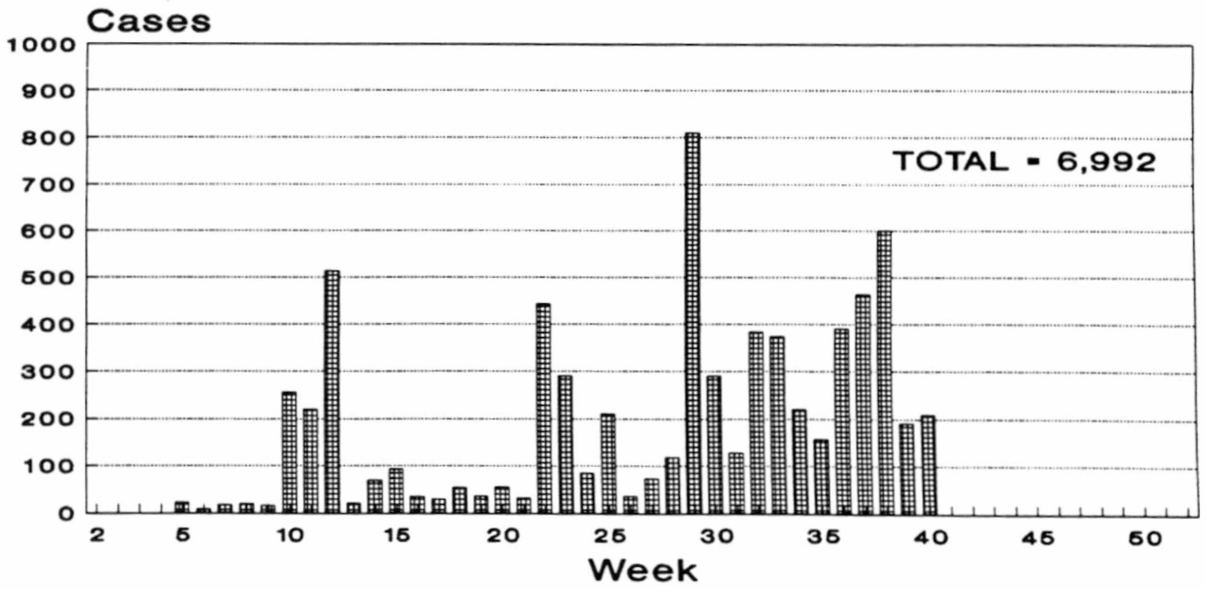
The first announcement has been published of the Fifth International Conference on Lyme Borreliosis. The meeting is scheduled to be held in Arlington, VA, USA, May 31-June 2, 1992. Those individuals who wish to receive the Second Announcement and Call for Papers must do so by request to the address below. The deadline for receipt of abstracts of papers and posters is a yet to be announced date in January 1992.

Secretariat
V International Conference on Lyme Borreliosis
9650 Rockville Pike
Bethesda, MD 20814-3998, U.S.A.
Telephone: (301) 530-7010
Telefacsimile: (301) 530-7014

REPORTING OF LYME DISEASE CASES IN 1991 BY NETSS

The number of Lyme disease cases reported through NETSS in the period January through October 5 are shown in Figure 1. Of the total 6,992 cases reported through Week 40, 4,309 (62%) were reported from the mid-Atlantic region. Upstate New York reported 2,865 cases (41% of the 1991 national total).

FIGURE 1
REPORTED LYME DISEASE CASES, U.S., 1991



ERRATUM

An Ixodes pacificus tick collected in Idaho was incorrectly stated to be an Ixodes dammini tick in the last issue of this newsletter (LDSS V2-N6, p.6).

Lyme Disease Surveillance Summary (LDSS) is edited by Drs. Robert Craven and David Dennis. If you have information to contribute or wish to receive a LDSS, please contact them at:

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