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Failure to Identify Borrelia burgdorferi in Southern California Ticks by DNA Amplification

Colleagues—In the absence of erythema migrans or late systemic sequelae, the diagnosis of Lyme borreliosis after tick exposure remains difficult. Problems include the nonspecific nature of patient complaints, lack of serologic standardization, and difficulty propagating the spirochete in artificial culture medium. Magid et al. [1] recently suggested that prophylactic antibiotics given after tick exposure may be cost-effective in areas where Borrelia burgdorferi is hyperendemic. Knowledge of the prevalence patterns of B. burgdorferi infection in potential tick vectors would be useful in assessing the risk of Lyme borreliosis in exposed patients and the utility of antimicrobial prophylaxis. We used polymerase chain reaction (PCR) to screen Southern California ticks for B. burgdorferi.

Ixodes pacificus is the predominant vector for B. burgdorferi transmission to humans on the West Coast of the United States and is found throughout the coastal mountain ranges of Washington, Oregon, and California. Despite the wide distribution of this vector, well-documented cases of Lyme borreliosis remain rare in southern California. Ecologic factors including enzootic cycles, tick feeding preferences, and nonuniform distribution of infected ticks may be responsible for the low incidence of documented human infection [2–4]. To better define the epidemiology and risk of clinical infection with B. burgdorferi in this area, we examined ticks from multiple locations in rural San Diego County and attempted to amplify spirochetal DNA with PCR primers known to be highly sensitive and specific.

We obtained 1046 adult I. pacificus by dragging appropriate habitat on 32 widely dispersed rural sites during 1990–1991. From this sample, 160 specimens (5 from each site) were randomly chosen for DNA amplification studies; assays were also done on a single engorged I. pacificus adult that was removed from the skin of a clinic patient. B. burgdorferi cultures were obtained from R. A. Wirtz (Department of Entomology, Walter Reed Armed Institute of Research, Washington DC). Oligonucleotides were synthesized and purified by Synthece Corp. (Rockville, MD). PCR reagents (Perkin-Elmer Cetus, Norwalk, CT) were used as prescribed by the manufacturer with an automated thermocycler device. Nucleotide sequences of PCR primers were defined according to Barbour [5a, 5b].

On initial PCR analysis two pooled tick homogenates proved negative for B. burgdorferi. When the same homogenates were amplified in the presence of exogenous B. burgdorferi bands of appropriate molecular weights for primers specific for B. burgdorferi were identified. Subsequent PCR analysis of all tick samples without exogenous B. burgdorferi added failed to detect DNA sequences of B. burgdorferi (as a positive control, B. burgdorferi alone was successfully amplified in each test).

We believe this represents the first use of PCR in screening significant numbers of competent vector ticks in southern California. Our test group (n = 161) represents a reasonably random sample. In adjacent Orange County, researchers tested 359 I. pacificus ticks by culture on BSK II medium and found only 1 to be positive (subsequently confirmed by immunofluorescent microscopy using specific monoclonal antibodies) [6]. According to the revised Centers for Disease Control and Prevention case definition [7], there have been no locally acquired cases of human Lyme borreliosis reported by San Diego County (E. Haas, Department of Health Services, personal communication). Adjacent Orange and San Bernardino Counties have reported a total of 3 patients with characteristic lesions of erythema migrans; however, the causative organism was not isolated [6].

Patients bitten by ticks are frequently concerned about developing Lyme disease. Clinicians can counsel their patients with reasonable certainty that the risk of acquiring the disease after tick exposure in this area remains low. Our data show a low prevalence of B. burgdorferi infection of competent tick vectors in southern California and argue strongly against routine antibiotic prophylaxis of tick-exposed patients. Future studies may be warranted as changing land use and development bring more people into contact with vectors of B. burgdorferi.

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References

Clarification of Dietary Risk Factors and Religion in a Botulism Outbreak

Colleagues—We would like to explain why, in an outbreak of botulism in Egypt caused by eating fseih (salted fish), the majority of patients were Coptic Christians [1]. Fseih is traditionally eaten on a national holiday, Sham-el-Nessim, but in 1991, Sham-el-Nessim and Ramadan coincided. During the month of Ramadan, most Muslims eat and drink only after sundown and avoid salty food because it makes them thirsty the following day.

Coptic Christians are under no such constraint and ate the fseih, causing this group to make up 78% of the patients, even though they represent only 15% of the population. One Muslim patient in the family case-control study ate fseih because she was menstruating, which exempted her from the Ramadan fast.

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Reference