LYME DISEASE, WITH EMPHASIS ON THE WESTERN U.S., AND ITS RELATIONSHIP TO WILDLIFE (Abstract only)

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ABSTRACT: In the western United States, Lyme disease has been reported primarily from the three Pacific states, especially California, and sporadically or not at all from various mountain states. In California, surveillance for Lyme disease was initiated in 1983, but it was not made a reportable disease in this state until 1989. Nevertheless, approximately 400 human cases were reported by California State Health authorities between 1983 and 1987. In 1982, I began studying the ecology and epidemiology of Lyme disease in the far-western United States in collaboration with Dr. Willy Burgdorfer of the Rocky Mountain Laboratories, Hamilton, Montana, and others. The objectives of this research have been to determine how the Lyme disease spirochete, Borrelia burgdorferi (Bb), is maintained and distributed in natural foci including the routes of transmission to humans and other animals. Five species of ticks have been found infected naturally with Bb or related borreliae during these studies, but of these only the western black-legged tick, Ixodes pacificus, has been implicated as a vector to humans. Transovarial and transstadial passage of Bb has been demonstrated in this tick, though the efficiency of these processes for maintenance of the spirochete is still being evaluated. Western fence lizards (Sceloporus occidentalis) and Columbian black-tailed deer (Odocoileus hemionus columbianus) were found to be major hosts of subadult and adult I. pacificus, respectively. Antibodies to Bb, spirochetemias, or both, have been detected in 8 species of wildlife in California (western fence lizard, 2 species of lagomorphs, 2 species of rodents, 3 species of deer). Species exhibiting the highest seropositivity rates (titers ≥1:64) include brush rabbits (≤100%) and black-tailed jackrabbits (≤90%). The widespread distribution of jackrabbits in the West, their prolific breeding habits, infestation by several species of ticks known to harbor Bb, and their high seropositivity rates render them suitable as sentinel animals for surveillance of Lyme disease. The reservoir competencies of some of these species of wildlife including Columbian black-tailed deer, and the vector competencies of their associated ticks, are currently under investigation.

Proc. 14th Vertebr. Pest Conf. (L.R. Davis and R.E. Marsh, Eds.)
Published at Univ. of Calif., Davis. 1990.