Detection of *Borrelia burgdorferi* DNA in Human Skin Biopsies and Dog Synovial Fluid by the Polymerase Chain Reaction.

J.A. SALINAS-MELÉNDEZ[1]; R. TAMEZ-GONZÁLEZ[1]; O. WELSH-LOZANO[2] & H.A. BARRERA-SALDAÑA[3].

[1]Departamento de Microbiología, F.M.V.Z. U.A.N.L., Av. Lázaro Cárdenas 4600, C.P. 64930, Monterrey, N.L., MEXICO
[2]Deptartamento de Dermatología, Hospital Universitario "Dr. José Eleuterio González", Monterrey, N.L., MEXICO.
[3]ULIEG. Departamento de Bioquímica, Facultad de Medicina, U.A.N.L., Apartado Postal 3-4125, Monterrey, N.L., MEXICO

SALINAS-MELÉNDEZ, J.A.; R. TAMEZ-GONZÁLEZ; O. WELSH-LOZANO & H.A. BARRERA-SALDAÑA. Detection of *Borrelia burgdorferi* DNA in human skin biopsies and dog synovial fluid by the Polymerase Chain Reaction. *Rev. Lat.-Amer. Microbiol.* 37:7-10, 1995.

ABSTRACT: The polymerase chain reaction was used to amplify DNA sequences of the etiologic agent of Lyme disease, *Borrelia burgdorferi*, and was applied to the detection of the spirochete in humans and dogs. Oligonucleotide primers used in the reaction flank a 244-base-pair representing part of the variable region V4 of the *B. burgdorferi* 16S rRNA from biopsies of patients with acrodermatitis, and in synovial fluid from a dog with arthritis. These data suggest the presence of the disease in our state.

SALINAS-MELÉNDEZ, J.A.; R. TAMEZ-GONZÁLEZ; O. WELSH-LOZANO & H.A. BARRERA-SALDAÑA. Detección de DNA de *Borrelia burgdorferi* en biopsias de piel humana y líquido sinovial de perro por Reacción de Polimerasa en Cadena (PCR). *Rev. Lat.-Amer. Microbiol.* 37:7-10, 1995.

RESUMEN: La reacción en cadena de la polimerasa (RCP) se utilizó para amplificar secuencias de DNA de *Borrelia burgdorferi*, agente etiológico de la enfermedad de Lyme, y se aplicó para la detección de la espiroqueta en muestras de humanos y caninos. Se utilizó un par de oligonucleótidos que amplifican un fragmento de 244 pares de bases que representan parte de la región variable V4 del gen 16S rRNA de *B. burgdorferi*. Utilizando la técnica de PCR, se pudo detectar al microorganismo en dos biopsias de piel de pacientes con acrodermatitis, y en el líquido sinovial de un perro con artritis. Estos datos sugieren la presencia de la enfermedad en nuestro estado.

INTRODUCTION

Lyme Disease, caused by the spirochete *Borrelia burgdorferi* is the most frequent tick-borne disease in Europe and the United States[3,9]. Infections by this microorganism causes a multisystemic disorder[20] characterized by a broad spectrum of serious manifestations involving the skin, central nervous system, heart, kidneys and eyes[16,19,21]. Lyme disease appears more common in the United States as an arthritic manifestation, whereas neurologic and dermatologic disorders are the more frequent manifestations in Europe[19].

Diagnosis of borreliosis is not straightforward, primarily because of several characteristics of *Borrelia burgdorferi* infection. Diagnosis of Lyme disease relies mainly on clinical and serological criteria. Antibodies against this microorganism are demonstrable by indirect immunofluorescence, ELISA and Western blotting[8]. Isolation of *Borrelia burgdorferi* from patient specimens is difficult, and microscopic detection of the spirochetes is not very sensitive[2]. Therefore, serology is the most widely used diagnostic procedure for this disease[5,13].

Antibodies against *Borrelia burgdorferi* can be detected only in 40 to 60 % of the patients during the first few weeks of infection or in patients with erythema chronicum migrans (ECM)[6,7,10].

In order to assay available clinical and research samples for *Borrelia burgdorferi* with high sensitivity and specificity, we adapted the in-vitro gene amplification technology by the polymerase chain reaction (PCR). It has been reported that by using PCR, it is possible to detect as few as 10 spirochetes per ml of blood or urine[14].