Chronic Persistent Lyme Borreliosis: PCR Evidence of Chronic Infection Despite Extended Antibiotic Therapy—A Retrospective Review

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Background:

B. burgdorferi has been proven by PCR analysis to establish a persistent infection in the mammalian host (Straubinger, R. *Persistence of B. burgdorferi in experimentally infected dogs after antibiotic treatment*. J.Clin.Microbiol.1997 Jan; 35(I): 111-116). Use of PCR assays to monitor the clearance of B. burgdorferi DNA from blood following antibiotic therapy has also been described (Manak et al, Abstract, IX Annual Intl Conference on Lyme Borreliosis, April 1996). This report describes serum PCR positivity in a cohort of chronic Lyme patients despite prolonged treatment with multiple antibiotic regimens.

Methodology:

80 patients with Lyme Borreliosis and/or Ehrlichiosis and Babesiosis were treated with multiple courses of antibiotics, including tetracycline derivatives (doxycycline, minocycline, tetracycline HCL), macrolides (azithromycin, clarithromycin) penicillins (amoxicillin, IM benzathine penicillin), cephalosporins (cefuroxime axetil, cefixime, IV ceftriaxone, IV cefotaxime) and metronidazole. These drugs were used alone or in combination, with hydroxychloroquine added to tetracycline or macrolide antibiotics in select patients. Patients with chronic persistent symptomatology post therapy had serum PCR testing done through MDL Laboratories in New Jersey. Between one and five specimens were sent on each patient, with serial specimens generally on consecutive days. Two sets of primers are utilized for the PCR reaction for each specimen: (I) the SL primers amplify a region of the B. burgdorferi *senso stricto* B31 OspA sequence; (II) The Ly primers amplify the region of the Ly1 chromosomal gene.

Results & Conclusion:

Patients received an average of 13 months of treatment (range: 1 month-53 months) with the longest course reserved for a patient with a severe chronic relapsing encephalopathy. All 80 charts reviewed showed serum PCR positivity for B. burgdorferi despite extended courses of antibiotics, and serial PCRs were frequently necessary to prove ongoing infection. Straubinger illustrated in the dog model that antibiotics decreased the total number of organisms in tissue samples, but did not eliminate the infection (Abstract, 12th Intl. Lyme Conference, April 1999), and others have shown persistent infection by PCR and culture even in patients with negative standard blood tests for Lyme (Bayer, et al: *Borrelia burgdorferi DNA in the urine of treated patients with chronic Lyme disease symptoms: A PCR study of 97 cases*. Infection, 1996 Sep, 24: 5, 347-353; OKSI et al: *Borrelia burgdorferi detected by culture and PCR in clinical relapse of disseminated Lyme borreliosis*. Ann Med 1999 Jun; 31(3): 225-232). This retrospective study highlights several points in chronic Lyme disease treatment: No single antibiotic or combination of antibiotics used was able to completely eradicate the infection, although significant clinical improvement was seen with chronic antibiotic therapy. Overlap of clinical syndromes may occur with Lyme disease and Babesiosis, and consecutive serial PCR specimens (5) for B burgdorferi and B microti are often useful to differentiate between these 2 disease states in patients with chronic persistent symptomatology.