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Harpal S Mangat

Howard College of Medicine, USA

Correlation of Lyme disease with immune dysfunction

Background: Lyme disease is caused by the bacterium *Borrelia burgdorferi*, transmitted to humans through the bite of infected blacklegged ticks. CD4/CD8 ratios in healthy adults vary across populations; in the US, a CD4/CD8 ratio ranging from 0.9 to 1.9 is considered to be normal in non-immunocompromised individuals. Lyme disease is diagnosed based on symptoms, physical findings (e.g. rash) and the possibility of exposure to infected ticks. Laboratory testing is helpful if used correctly and performed with validated methods. The US Center for Disease Control (CDC) diagnostic criteria requires the identification of five Western blot IgG bands for a positive diagnosis, although patients with less than five positive bands have been subsequently diagnosed with Lyme disease through urine PCR in Nanotrap testing.

Material & Methods: 183 patients at two medical centers were evaluated in Lyme endemic communities in Maryland, USA. Further investigation of 148 of these patients correlated their CD4/CD8 ratio with their Ig41 band, using one and two tail testing.

Results: The mean CD4/CD8 ratio in the 148 patients was 2.41 with a variance of 1.05 and a standard deviation of 1.025. Assuming a normal CD4/CD8 ratio of less than 2, with a 5% confidence interval, the p-value on both a one tailed and two tailed test was shown to be 0.00001. Two patients with an initial CD4/CD8 ratio of 2.7 and 2.8 who were IgG 41 positive were subsequently tested with the Nanotrap urine PCR and found to be positive for Lyme.

Conclusions: Increased CD4/CD8 ratio with a positive IgG 41 band appears to be a strong predictor of a subsequent diagnosis of Lyme disease despite current diagnostic guidelines. Further research should not only be directed towards investigating how *Borrelia burgdorferi* disrupts immune function, but also towards improving diagnostic guidelines in light of validated diagnostic methods.

Biography

Harpal S Mangat, MD, is an Assistant Professor at Howard University College of Medicine. He submitted recommendations to his US senator that got incorporated into the 2010 Affordable Health Care Act. He has four issued US patents and additional patents have been filed. He is a Graduate of the Royal College of Surgeons, Ireland, trained at Trinity College Dublin, Oxford University and London University in Family Practice and Ophthalmology. In the US, he trained at University of South Florida and Mercy Hospital Philadelphia in Ophthalmology and Internal Medicine. He is the Transport Physician for difficult cases returning to United Arab Emirates. His clinical interests include innovative new technologies, neuroprotection, diabetes, sleep apnea, Lyme disease, especially its neurological manifestations, as well as long distance air transport of seriously ill patients.

harpal.mangat@howard.edu

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