Comprehensive seroprofiling of sixteen <i>Borrelia burgdorferi</i> OspC: implications for Lyme disease diagnostics design

Abstract:

Early diagnosis of Lyme disease (LD) is critical to successful treatment. However, current serodiagnostic tests do not reliably detect antibodies during early infection. OspC induces a potent early immune response and is also one of the most diverse proteins in the Borrelia proteome. Yet, at least 70\% of the amino acid sequence is conserved among all 21 known OspC types. We performed a series of comprehensive seroprofiling studies to select the OspC types that have the most cross-reactive immunodominant epitopes. We found that proteins belonging to seven OspC types detect antibodies from all three infected host species regardless of the OspC genotype of the infecting strain. Although no one OspC type identifies all seropositive human samples, combinations of as few as two OspC proteins identified all patients that had anti-OspC antibodies.