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Western Blotting technique improvement as a diagnosis support in Baggio-Yoshinari Syndrome

Virginia Lucia Nazario Bonoldi (Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, SP, Brasil), Patrícia Antonia Estima Abreu (Instituto Butantan, São Paulo, SP, Brasil), Natalino Hajime Yoshinari (Faculdade de Medicina da Universidade de São Paulo, São Paulo, SP, Brasil), Rosa Maria Rodrigues Pereira (Faculdade de Medicina da Universidade de São Paulo, São Paulo, SP, Brasil)

BACKGROUND

Baggio-Yoshinari Syndrome (BYS) is caused for Borrelia sp (Bb) and vectored by tick bite. It's simile to Lyme Disease (LD), including erythema migrans (EM) and systemic manifestations. The etiological agent does not grow in culture medium thus, American Bb is used in ELISA and Western Blot (WB), but serology has low specificity. The aim of this study was to identify protein bands of Bb recognized by IgG and IgM WB from serum samples of clinically proven BYS (EM, systemic manifestations and history of tick bite).

MATERIALS AND METHODS

Forty BYS patients were selected. Ninety patients with spotted fever (n=30), chikungunya fever (n=30) and healthy individuals (n=30) were selected as the control group. WB was performed using Bb whole antigen separated in 10% SDS-PAGE gels and transferred onto nitrocellulose membrane. Membrane strips were incubated with each serum sample and anti-human IgG and IgM secondary antibodies. A polyclonal serum from rabbit immunized with Bb G39/40 lysate and IgG and IgM sera from North-American LD patients were used as positive controls.

RESULTS

BYS patients' sera recognized 20 protein bands from IgG WB (17, 18, 21, 26, 31, 34, 37, 38, 41, 43, 46, 50, 56, 60, 66, 68, 74, 80, 95, 110kDa) and 13 from IgM WB (18, 22, 26, 31, 34, 35, 41, 46, 49, 52, 66, 78, 95 kDa). Cross-reactivity was observed from control group in 17, 18, 21, 26, 56, 68 and 74kDa protein bands for IgG WB and 18, 34 and 52kDa for IgM WB. Rabbit serum IgG polyclonal recognized 14, 22, 32, 41, 46, 68 and 95kDa bands. LD patients' sera reacted with 18, 21, 28, 30, 39, 41, 45, 58, 66 and 93kDa IgG bands and 12, 17, 23, 26, 31, 34, 41, 46, 66, and 95kDa IgM bands. Frequency of each protein bands recognized by IgG and IgM BYS patients' sera were compared to the control groups. The most specific protein bands for BYS were determined for IgG WB (31, 41, 46, 60, 80, 95 and 110kDa) and IgM WB (26, 31, 34, 41, 46 and 95kDa).

CONCLUSION

The study suggests that in the absence of Borrelia native antigen, specific protein bands of B. burgdorferi may be used for helping BYS diagnosis, increasing test specificity. Further studies regarding sensitivity and specificity of this serology criterion are necessary to establish a more accurate diagnosis.

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