Use of Indirect Hemagglutination Assay Based on Recombinant Proteins for Serodiagnosis of Bovine and Ovine Brucellosis

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Abstract

Brucellosis, the pathogen of which was discovered at the end of the 19th century, still remains one of the widespread zoonosis. One of the main links in the fight against brucellosis is the accurate identification and timely isolation of infected animals. Serological tests used to diagnose brucellosis are based on the detection of antibodies against lipopolysaccharide (LPS), pathogen's cell surface antigen. *Brucella* LPS, due to its similarity to the same antigen of other Gram-negative bacteria, often leads not only to false positive results, but also creates the problem of differentiating infected from vaccinated individuals. The aim of our study was to obtain *Brucella* recombinant outer membrane (Omp19, Omp25, Omp31) and periplasmic proteins (Sod, Bp26) and determine their antigenicity in the indirect hemagglutination assay (IHA), which is easy to perform and can be used in the field. Blood sera from cattle (n=50) and sheep (n=46) positive for brucellosis by a combination of traditional tests (RBPT, CFT and SAT) were used. Omp31, Omp19 and Omp25 gave relatively high sensitivity to IHA in testing blood sera of both cattle and sheep (92-94%; 74-83% and 76-98%, respectively). Of note is the strong correlation between IHA variants based on Omp31 and Bp26 in both cattle and sheep testing (r=0.691 and r=0.667, respectively). Thus, the possibility of using *Brucella* recombinant proteins as an antigen in IHA has been proven for the first time. The obtained results indicate the need to determine the diagnostic value of IHA/Omp in comparison with the “gold standard” - culture isolation.

Keywords

Brucella, recombinant protein, serodiagnosis, indirect hemagglutination assay.