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Evaluation of diagnostic potential of recombinant D-erythrulose 1-phosphate dehydrogenase using indirect enzyme-linked immunosorbent assay for diagnosis of bovine brucellosis

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Serological tests used for diagnosis of bovine brucellosis are usually depending on smooth lipopolysaccharides (S-LPS) as a diagnostic antigen which usually gives false positive reactions. So, our study aims to produce and evaluate a diagnostic kit for accurate diagnosis of bovine brucellosis differentiating between vaccinated and infected cattle and exclusion of false positive cases. Idea of this kit depends upon the fact that The *EryC* gene is absent in *Brucella abortus* S19 only but it is present and functional in all other *Brucella* strains and isolates so according to these facts, the use of ELISA kit coated with single subunit (recombinant) *EryC* protein may be useful, rather than S-LPS, as an alternative diagnostic antigen in diagnosis of bovine brucellosis and differentiation between S19 vaccinated and *Brucella* infected cattle. The present study evaluated antibody responses of brucellosis infected and S19 vaccinated cattle to purified recombinant *EryC* protein in an indirect enzyme-linked immunosorbent assay (I-ELISA). Cattle sera were screened using Rose Bengal Plate test (RBPT). 114 samples of naturally infected cattle (Rose Bengal test positive), 78 sera from S19 vaccinated cattle and 25 sera samples from *Brucella* free cattle were used in this study. I-ELISA using S-LPS and periplasmic proteins as a coating antigen were used as a gold standard test. The results revealed that in case of sera of naturally infected cattle, sero-positivity was 94.7%, 100%, 100% and 100% with *EryC*-ELISA, LPS-ELISA, periplasmic-ELISA and Rose Bengal test respectively. Where in case of sera of S19 vaccinated cattle, all samples were negative when tested with *EryC*-ELISA while in case of LPS-ELISA, periplasmic-ELISA and rose Bengal test, sero-positivity was 92.3%, 84.6% and 100% respectively. It could concluded that the *EryC* protein could be used in serological tests for diagnosis of bovine brucellosis and differentiation between infected and *Brucella abortus* S19-vaccinated cattle but more studies are needed to be done on large cattle populations accompanied with bacteriological isolation to detect the sensitivity and specificity of this protein as a diagnostic antigen and also for validate this test.

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