Novel approach of vaccination against Brucella abortus 544 based on a combination of fusion proteins, human serum albumin and brucella abortus Lipopolysaccharides.

ABSTRACT

Lipopolysaccharide (LPS) of Brucella abortus is an essential component for developing the subunit vaccine against brucellosis. B. abortus LPS was extracted by n-butanol, purified by ultracentrifugation and detoxified by alkaline treatment. Pyrogenicity and toxicity of B. abortus LPS and detoxified–LPS (D-LPS) were analyzed and compared with LPS of E. coli. Different groups of mice were immunized intraperitoneally with purified B. abortus LPS, D-LPS, a combination of LPS with human serum albumin (LPS-HSA) and B. abortus S19 bacteria; besides, control mice were inoculated with sterile saline. Two doses of vaccine were given 4 weeks apart. Mice were challenged intraperitoneally with virulent B. abortus 544 strain 4 weeks after the second dose of vaccine. Sera and spleens of mice were harvested 4 weeks after challenge. LPS-B. abortus was 10,000-fold less potent in LAL test and 100-fold less potent in eliciting fever in rabbits than in E. coli LPS. And D-LPS was very less potent in LAL test and eliciting fever in rabbits ordinary LPS. The antibody titer of anti-LPS immunoglobulin G (IgG) was higher than D-LPS. However, mice immunized with either LPS, D-LPS or LPS-HSA vaccines showed a significant protection against infection of the spleen ($p<0.01$). There was no significant difference between mice immunized with LPS and D-LPS in terms of protection ($p<0.99$). Therefore, it was concluded that D-LPS and LPS-HSA for B. abortus can be used as safer and more potent vaccines than ordinary LPS-B. abortus vaccine.

Keyword: Novel approach of vaccination; Brucella abortus 544; Fusion proteins; Human serum albumin; Brucella abortus lipopolysaccharides.