IMMUNOGENICITY AND EFFICACY OF DNA AND RECOMBINANT PROTEIN VACCINE COMBINING LipL32 AND Loa22 FOR LEPTOSPIROSIS

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Abstract:

Leptospirosis is a worldwide zoonotic disease caused by pathogenic *Leptospira*, a genus of which more than 250 serovars have been identified. Commercial bacterin vaccines are limited in that they lack both cross-protection against heterologous serovars and long-term protection. This study investigated the immunogenicity and protective efficacy of a candidate vaccine using the outer membrane proteins LipL32 and Loa22 as antigens. A heterologous prime boost immunization was employed using a chitosan (CS) nanoparticle as a delivery system for DNA vaccine followed by boosting with recombinant proteins. First, the immunogenicity in mice triggered by either a single or two antigens was compared. The specific antibody responses against LipL32 (total IgG and IgG1) and Loa22 (IgG1) were higher in mice receiving two antigens than those vaccinated with a single antigen alone. In an *in vitro* stimulation assay, splenocytes from mice vaccinated with antigens exhibited higher interferon-γ and IL-2 production than when using either single antigen alone. These results suggested that LipL32 and Loa22 antigens in combination in a heterologous prime-boost immunization regimen induced better humoral and Th1-type cell-mediated immune response. The protective efficacy was tested in a hamster model using the aforementioned vaccine regimen and the animals were subjected to homologous challenge with *Leptospira interrogans* serovar Pomona. However, there was no significant difference in the survival rate between the two-antigen vaccinated groups in comparison to the PBS control group, suggesting that vaccine with the combination of LipL32 and Loa22 in a DNA-primed and protein-boosted immunization is not protective against leptospirosis in hamsters.

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