

Safety and Efficacy of Recombinant Clostridium botulinum Types B Vaccine Candidate

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Abstract : Botulism is a paralytic disease of human beings and animals caused by neurotoxin produced by Clostridium botulinum. The neurotoxins are genetically distinguished into 8 types, A to H. Ingestion of performed toxin, usually types B, C, and D, have been shown to produce diseases in most cases of cattle botulism. Vaccination is the best measure to prevent cattle botulism. However, the commercially available toxoid-based vaccines are difficult and hazardous to produce. We produced recombinant protein using gene of heavy chain domain of botulinum toxin B of which binds to cellular receptor of neuron cells and used as immunogen. In this study, we evaluated the safety and efficacy of botulism vaccine composed of recombinant types B. Safety test was done by National Regulation for Veterinary Biologicals. For efficacy test, female ICR mice (5 weeks old) were subcutaneously injected, intraperitoneally challenged, and examined the survival rates compared with vaccination and non-vaccination group. Mouse survival rate of recombinant types B vaccine was above 80%, while one of non-vaccination group was 0%. A vaccine composed of recombinant types B was safe and efficacious in mouse. Our results suggest that recombinant heavy chain receptor binding domain can be used as an effective vaccine candidate for type B botulism.

Keywords : botulism, livestock, vaccine, recombinant protein, toxin

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