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Lactic acid bacteria (Lab) as a potent adjuvant increase immunogenicity of reverse genetics derived H5N9 vaccines in domestic ducks

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Statement of the Problem: Ducks are a natural reservoir for the 16 hemagglutinin (HA) and 9 neuraminidase (NA) subtypes of the influenza A virus. While being highly lethal to chickens, H5N8 HPAI virus can be non-lethal to domestic ducks, which range from asymptomatic infection to severe disease with mortality. In this situation, vaccination is one of the few tools available to control HPAI infection in duck industry. But most oil-adjuvanted vaccines produced for chickens might be inadequate in ducks to provide optimal immunity. In this study, we generated rgH5N9 strain and we assessed the possibility of LAB as a potent adjuvant in inactivated oil-emulsion vaccine.

Methodology & Theoretical Orientation: LAB was isolated from Kimchi samples. As one of them, Lactobacillus plantarum was selected based on the screening assay. We generated rgH5N9 deriving the hemagglutinin gene from HPAI A/Baikal teal/ Korea/1449/2014 (H5N8) and neuraminidase gene from the low pathogenic H11N9 that was isolated during the environmental surveillance. The reassortant virus was propagated by inoculating into embryonated chicken eggs. EID50/ml of inactivated antigens supplemented with different dose of LAB was used to formulate a water-in-oil emulsion vaccine. One-week-old Pekin ducks were vaccinated. Hemagglutinin inhibition test (HI test) was conducted using duck serum. Safety of LAB using as adjuvant was demonstrated by rate of gain and histological examination.

Findings: The LAB supplement vaccine group showed faster induction of humoral immune response compared to other groups. And rate of gain was not important compared with mock group.

Conclusion & Significance: To our knowledge, this is the first study reporting the efficacy of inactivated oil-emulsion vaccine supplemented with LAB in ducks. In this study, the oil-emulsion vaccine combined with the LAB elicited a higher humoral immune response. Although this study did not include responses of immune cells, our results imply that supplementation of LAB to inactivated oil-emulsion vaccine could be an attractive strategy in ducks.

Biography

Jun Beom Kim is a graduate student of Konkuk University. His major is in Veterinary Microbiology and Infectious Disease. He has his expertise in evaluation of poultry vaccines and improving vaccination method.

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