Pathogenicity and immunogenicity of live attenuated and inactivated fowl adenovirus in commercial broiler chickens

ABSTRACT

Fowl Adenovirus (FAdV) is a non-enveloped DNA virus which is the primary pathogen of Inclusion Body Hepatitis (IBH) in chickens. IBH outbreaks were reported worldwide and was first reported in Malaysia in 2005 due to FAdV strain of serotype 8b infection. It was objective of the study to determine pathogenicity and immunogenicity of live attenuated and/or inactivated FAdV strain of serotype 8b (UPM1137) of Malaysian isolate in commercial broiler chickens. The 54, 1-day-old Cobb 500 broiler chicks were divided into four groups, namely groups A-D. Feed and water were provided ad-libitum. The chicks in groups A-C were inoculated with inactivated FAdV (0.2 mL) with virus titer of 106.5 TCID50 /0.2 mL, live attenuated FAdV (0.1 mL) with virus titer of 105.2 TCID50 /0.1 mL and the combination of the inactivated (0.2 mL) and live attenuated (0.1 mL) FAdV, respectively at day old and day 14 post-inoculation (pi). Body weight and blood samples were collected prior to necropsy at days 14 and 28 pi, except sampling was also conducted at day 0 pi in the group D (control). On necropsy, the gross lesions and liver weight were recorded and samples of liver were collected for histological examination. The study showed that neither clinical signs nor gross and histological lesions were recorded in all group of chickens throughout the trial. The body weight of chickens at days 14 and 28 pi were not significantly different ($p>0.05$) among all the groups. The liver to body weight ratio of group C was significantly higher ($p<0.05$) than groups A and D at day 28 pi. The FAdV antibody titer in group D (control) was 938±1596 on day old and was not detected at days 14 and 28 pi. However, the FAdV antibody was induced at high titer in all the inoculated groups at days 14 and 28 pi. The FAdV antibody titer of group C was significantly ($p<0.05$) higher than groups A and B at day 28 pi. It was concluded that the live attenuated and inactivated FAdV are safe and able to induce FAdV antibody titer in broiler chickens with moderate level of maternally derived antibody at day old of age. The combination of live attenuated and inactivated FAdV was able to induce higher antibody titer when compared to sole use of live attenuated or inactivated FAdV. It has high potential to be used as vaccination strategy against IBH outbreaks.

Keyword: Fowl Adenovirus (FAdV); Commercial broiler chicken; Live attenuated; Inactivated; Pathogenicity; Immunogenicity